REVISION OF THE GENUS *CATASARCUS* SCHÖNHERR (COLEOPTERA: CURCULIONIDAE)

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Pp. 357–454; 1 *Plate*, 64 *Text-figures*, 4 *Maps.*

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REVISION OF THE GENUS *CATASARCUS* SCHÖNHERR (COLEOPTERA: CURCULIONIDAE)

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CONTENTS

SYNOPSIS

Catasarcus Schönherr is an exclusively Australian genus. As here treated, it comprises 41 species and one subspecies. The latter, and 19 of the species are described as new. All, with one exception, are included in a key. Twenty-one species are figured (19 for the first time) and there are photographs of three others. All the types of previously described species (except one) have been located and checked and are formally cited.

Most species have small ranges and these are indicated, where known, by maps and lists of localities. Attention is drawn to the importance of accurate locality data in the study of flightless insects.

INTRODUCTION

The present work originated in an attempt to complete a revision of *Catasarcus* begun in 1955 by the late Sir Guy Marshall. His revision was far from completion and, as much additional material containing several undescribed species became available, it was decided to start the revision afresh.

Four of the species described here bear the manuscript names proposed for them by Marshall and this fact is stated in each case.

HISTORY OF THE GENUS

Catasarcus was erected by Schönherr (1840) for four species described in this work by Fåhraeus and two described previously by Boisduval (1835) in the palaearctic

genus *Cneorhinus* Schönherr, 1826. Further species were described by Boheman in Schönherr, 1845 (1); Germar, 1848 (1); Pascoe, 1870 (34); Blackburn, 1894 (2), 1896 (1); Lea, 1909*a* (4) and 1917 (1 var.). Numerous unpublished names occur on specimens examined by Chevrolat (in his own collection), Pascoe (in his own collection) and Marshall (in various museums). None of these names is quoted here. Discounting two names published in synonymy by Fåhraeus in Schönherr (1840), the total of available names is 50.

By 1931, when the genus appeared in *Coleopterorum Catalogus* (**114**: 7), five of these names had been placed in synonymy. Of these synonymies, one is here maintained, two are altered and two revoked. In the present work, a further 24 names are sunk (including the variety, which is also promoted to specific rank) and one is transferred to another genus. With the addition of 20 new names, there is a net decrease of three in the 1931 total.

The genus has been redescribed by Labram and Imhoff (1848, No. 27), Lacordaire (1863 : 249) and Pascoe, whose revision of the genus appeared in 1870. The species were catalogued by Gemminger and Harold (1871 : 2311) and Masters (1872 : 217 and 1886 : 592). Lea (1897 : 590–600) published a series of observations, including a critical review of Pascoe's treatment of the quadrispinate species. He also included species of *Catasarcus* in various lists (1908 : 129, 1909*b* : 216, 1911 : 180). The genus was mentioned by Froggatt (1907 : 182) and Tillyard (1926 : 242). The name occurs in Heyne and Taschenberg (1908 : 226), in a key to the genera of Leptopiini by Heller (1923 : 148) and in a list of the Coleoptera described by Blackburn (Lea 1912 : xvii). As stated above, the genus appeared in *Coleopterorum Catalogus* in 1931.

DISTRIBUTION

(Map 1)

The genus *Catasarcus* is confined to the mainland and certain off-shore islands of Australia. It occurs on Kangaroo I. and on several small islands near Perth. No species is known to occur in Tasmania, New South Wales or Queensland. There are two species and one subspecies in eastern Australia; the remainder occur in Western Australia, mostly south of Geraldton (29° S) but extending along the coast to North West Cape (22° S). Most of the species have restricted ranges but one (*C. armatus*) extends from Western Australia into both South Australia and the Northern Territory.

A glance at the maps showing the ranges of individual species (pp. 403, 450) and especially that showing the distribution of the two subspecies of *C. transversalis* (p. 380) will show how important precise locality data is in the study of flightless insects. The present revision has been severely hampered by the false and inaccurate data on many specimens. Lea's comment (1909*a* : 156) on specimens in European museums applies equally to Australian material. Some early specimens have no labels at all and the value of data such as 'Interior' is obvious. Apart from patently false localities, some recent labels are astonishingly vague, e.g. 'Everard Rgs., S.A. to Warburton Rgs., W. A.' (a distance of about 370 miles). In another case—' Central Austr./26.vi.1927/G. Horne '—proper data would have provided a second locality for one of the remotest and most interesting species.

MAP 1. *Catasarcus*. Range. The Nullarbor Plain should be included (see p. 446).

BIOLOGY

Very little has been recorded on the biology of the adults and the immature stages are virtually unknown, in spite of the fact that several species are common in well populated areas.

Records of adult host-plants are few and do not indicate which parts of the plant, if any, are attacked. A total of five families and nine genera, mostly of xerophytic trees and shrubs, is at present implicated, namely: *Leptospermum*, *Melaleuca*, *?Eucalyptus* (Myrtaceae); *Jacksonia*, *Acacia* (Leguminosae); *Banksia*, *Hakea* (Proteaceae); *Casuarina* (Casuarinaceae) and *Xanthorrhoea* (Xanthorrhoeaceae). This range of families and the fact that three species of *Catasarcus* have been recorded from more than one host-plant family indicate a low degree of host-specificity.

The habit in many Curculionidae of dropping to the ground when disturbed, seems to be especially well marked in *Catasarcus*, a fact which should be borne in mind by collectors and which has been reported for *C. transversalis* by Tepper (1887 : 30) and

by the late F. E. Wilson (personal communication). Wilson states: '. . . it will frequently drop to the ground from its resting place when one gets within a yard or two of it. When lying doggo, it is difficult to see on the greyish sand of its habitat'.

The eggs and young larvae of *C. asphaltinus* have been seen by Mrs. P. Sundstrom and a report of her observations is given under this species (p. 411).

SOURCES OF MATERIAL

The following sources of material are indicated in the text by the symbols which precede them.

A	Australian Museum, Sydney.
BM(NH)	British Museum (Natural History), London.
California	California Academy of Sciences, San Francisco.
CSIRO	C.S.I.R.O. Division of Entomology, Canberra.
Dresden	Staatliches Museum für Tierkunde.
FEW	F. E. Wilson, East Malvern, Victoria. (Mr. Wilson's collection is now in the National Museum of Victoria.)
FHUB	Dr. F. H. Uther Baker, Applecross, Perth.
Frey	Museum G. Frey, Tützing.
Macleay	Macleay Museum, University of Sydney.
Manchester	Manchester Museum, University of Manchester.
Munich	Zoologische Sammlung des Bayerischen Staates.
New York	American Museum of Natural History.
NSWAg	New South Wales Department of Agriculture, Rydalmere.
Oxford	Hope Department of Zoology (Entomology), University Museum, Oxford.
S	South Australian Museum, Adelaide.
Stockholm	Naturhistoriska Riksmuseum.
UW	University of Western Australia, Perth. (This material is now in the Western Australian Museum.)
V	National Museum of Victoria, Melbourne.
W	Western Australian Museum, Perth.
Washington	United States National Museum.

ACKNOWLEDGEMENTS

Among those who have sent me specimens for study I would like to thank especially Messrs C. Koch (W), A. Neboiss (V), G. F. Gross (S) and above all Dr. F. H. Uther Baker of Perth, who has not only made available to me his private collection but has sought diligently for further material, both in collections and in the field and has taken endless trouble to trace obscure localities. He has, to his great credit, collected no fewer than 23 species in the field, 13 of which are new.

My thanks are similarly due to Dr. P. B. Carne (CSIRO), A. M. Douglas (Perth), Dr. J. W. Evans (A), Dr. H. Freude (Munich), E. Gowing-Scopes (Halstead, England), my friend Dr. E. Haaf (formerly of the Frey Museum), Miss E. Hahn and Mrs. J.

Anderson (Macleay), Dr. R. Hertel (Dresden), the late Dr. W. D. Hincks (Manchester), Prof. Dr. J. O. Hüsing (Martin Luther Universität, Halle), the late Dr. E. Kjellander (Stockholm), Hugh B. Leech (California), Mrs. P. Sundstrom (Perth), E. Taylor (Oxford), Mrs. P. Vaurie (New York), J.-M. Vrydagh (Institut royal des Sciences naturelles de Belgique, Brussels), Miss R. E. Warner (Washington) and the late F. E. Wilson (East Malvern, Vict.).

I owe a special debt of gratitude to Dr. G. Kuschel of Nelson, N.Z. (late of Santiago, Chile) both for locating and studying the types of Boisduval on my behalf and for giving me help and encouragement at a critical stage in this study.

I am indebted to my senior colleague, Mr. J. Balfour-Browne for checking the typescript and making valuable suggestions. I also wish to thank Dr. E. B. Britton (now at CSIRO, Canberra) who collected some valuable material during a visit to Australia and my present colleagues R. D. Pope, Miss C. M. F. von Hayek, Dr. R. Madge and Dr. N. A. Aslam for their interest and advice.

I am very grateful to M. J. D. Brendell and Miss E. R. Tozer for testing the key.

The 21 figures of whole insects were executed by Mrs. C. A. O'Brien and Text-figs. 2–5 by Mr. Arthur Smith.

CATASARCUS Schönherr

Catasarcus Schönherr, 1840 : 812.

Type-species: *Catasarcus bilineatus* Fåhraeus in Schönherr, 1840: 813, by original selection.

Characters

Apterous Leptopiinae having a dorsal transverse furrow or impressed line near base of rostrum; frons with median longitudinal sulcus leading off from transverse rostral furrow and two or four longitudinal carinae; post-humeral region of elytra with a spine, tubercle or bulge (absent in individual specimens of some species).

Members of this genus also have the following characters in common:

Mandibles multisetose and usually partly squamose. Rostrum × 1–1·5 as long as broad; dorsal area flat with margins raised and median carina present, continuous with epistome. Antennal funicle with seven segments; scrobes lateral, linear, deep and oblique. Prothorax distinctly broader than long, with traces of two dorsal transverse striae, about equidistant from each other and the pronotal margins. Scutellum very small or obsolete. Metepisternal suture indicated at extreme anterior end only; posterior end dorsally with finger-like process projecting posteriad over metathoracic spiracle. Elytra without any swelling at shoulders but often with humeral tubercles; costal margin strongly sinuous. Intercoxal process of ventrite 1 truncate and almost twice as broad as a hind coxa; suture between ventrites 1 and 2 arcuate, deep at sides, becoming fine or obscure in mid-line; lengths of ventrites 3 and 4 subequal and together $\simeq 2$. Legs with femora more or less claviform; tibiae with teeth along ventral (inner) margin, weakly mucronate at apex and with corbels enclosed; tarsi (especially segment 3) *all* larger in proportion to overall size in male than in female; claws free, but only weakly diverging, simple. Ovipositor strongly sclerotized and without styli.

The transverse furrow is represented by an impressed line in only one species, *C. memnonius*, in which it is also deflected posteriad in the middle and at the sides by processes from the rostrum; in all other species it is deeper and straight.

About a third of the species have prominent dorsal spines on the elytra. It is these species, with one exception, which have a large spine in the post-humeral region of the elytra. The exception is *C. albipectus*, which has long dorsal spines but only a very small tubercle or bulge behind the shoulder. The non-spiny species have either a large bulge often surmounted by a blunt tubercle, or a small, sometimes sharp tubercle, or a small and often indistinct bulge. In general, this post-humeral prominence lies in interstria 10 (between striae 9 and 10) in the non-spiny species but in interstria 9 in those with dorsal spines. It is interesting to note that in the latter group there is a gap in stria 9 below the spine and the strial punctures on each side are drawn upwards towards the base of the spine, as if the spine had emerged in interstria 10 and then forced its way through stria 9 into interstria 9. In the non-spiny species the tubercle is often closer to stria 9 than 10 and when large causes displacement or even interruption of stria 9. In the non-spiny *C. memnonius*, which is believed to have an affinity with the spiny species, the tubercle emerges about in the line of stria 9 as it also does in the spiny *C. albipectus* in which (as stated above) it is very small and so does not interrupt the stria.

The dorsal spines also cause gross distortion of the strial punctures on the disc, so that it is not always easy to decide in which interstriae the spines are situated. That the spines are not present as such in the pupa is suggested by a specimen of *C. spinipennis* in which, though subsequently fully hardened, the elytra failed to expand completely at eclosion; the anterior spines are absent and the distal half of each posterior spine is invaginated into the base. It is difficult to see how this condition could arise if the spines had been fully formed before eclosion.

Apart from *C. sericeus*, of which only five females have been seen, both sexes are known to occur in all species. The sex ratio usually approaches parity but males predominate in *C. albipectus*, *C. griseus* and possibly other species. In addition to having larger tarsi, the elytra in the male are usually slightly narrower and more evenly rounded, both above and at the sides, than in the female, though in species with globose elytra, they are similar or even slightly broader in the male. Ventrite 5 is usually less strongly convex in the male and weakly truncate and setose at the apex, whereas in the female it is entire. In some spiny species, the post-humeral tubercles are large in the female but very small or absent in the male.

Spurious Characters used by previous Authors

The following characters were used solely, or principally, to distinguish the species indicated:

Bleaching: C. stygmatipennis (Boisd.); *C. ceratus* Pasc.; *C. pollinosus* Pasc.; *C. albuminosus* Pasc.

This is a curious condition which I have not encountered in any other genus. It is found in specimens which have suffered severe abrasion; not only are the scales and clothing setae missing but also the large setae of the legs and the corbellar fringes; in extreme cases, even the tarsal pads may be lost. The cuticle, whether black or red, becomes a uniform pale greyish colour with a waxy sheen. This effect is most pronounced on the more exposed surfaces; thus the underside, the frontal sulci and

the strial punctures are often unaffected. The cuticle is not only bleached but softened and minor surface irregularities are smoothed out. If the soft layer is scraped off, firmer cuticle of the original colour is found beneath.

This condition is common in some species (e.g. *C. impressipennis*) but rare or unknown in others. Lea (1897 : 593–594) gives a good account of it and suggests that it may be caused by the weevils rubbing against comparatively hard leaves (*Banksia, Acacia,* etc.) since he observed that specimens from very soft-leaved plants were unaffected. Precisely how the effect is produced is unknown.

Extraneous Granules : C. capito Pasc.; *C. furfuraceus* Pasc.

Described by Pascoe as ' sand-like exudation ', these granules are resinous in nature; on gentle heating they melt and evaporate, leaving a tarry residue which, on stronger heating, leaves a whitish ash. They are insoluble in water, alcohol and benzene.

In the type specimens in question, they are very numerous and hence rather conspicuous but I have seen them in smaller numbers on specimens of several other species; they are often attached to the long setae on the tibiae. They are presumably derived from the plant on which the weevil lives.

Cuticle Thickness : C. mollis Lea; *C. durus* Lea.

Lea first mentions this character in 1897 (: 599) and comments that it ' has been entirely overlooked by Mr. Pascoe '. As indicated in the discussion on p. 420 below, I regard this character as having little value. In this instance, Lea merely separated teneral and fully hardened specimens of the same species.

In addition to the above examples, a number of Pascoe's species are based on abnormal or defective specimens; these are discussed under the species concerned.

Relationships

Catasarcus has no close relatives. The only form known to me which exhibits any of the major distinguishing characters of *Catasarcus* is an undescribed species and genus from the northern part of Western Australia.

At the same time, it has so far proved impossible to subdivide the genus. Several more or less distinct species-groups are apparent but the affinities of many species remain in doubt. Pascoe, in his revision, divided the genus according to the number of dorsal spines on the elytra. The present study shows that this character can be misleading. For example, *C. carbo* and *C. lepidus* are shown to be closely related, yet the former has four spines and the latter eight. Even as an artificial character the spines are not always reliable. A more useful character is afforded by the apex of the ovipositor which is laterally compressed or cylindrical in most spineless and quadrispinate species but dorso-ventrally flattened and blade-like in some multi-spinate species. Serious anomalies occur, however. Thus it is blade-like in the quadrispinate *C. marginispinis* but cylindrical in the apparently closely related *C. concretus* which has six dorsal spines; also, it is cylindrical in *C. murex* which has eight spines and flattened in *C. memnonius* which has none. Another important

character, used successfully by Marshall in other groups, is the number of setae on the mentum. The ten species from *C. latheticus* to *C. longicornis* inclusive (except *C. carinaticeps*) have 6 or more setae, while most of the other species have only 4. But *C. carinaticeps* has 4 or 6 and both *C. azureipes* and *C. inaequalis* have 6 or more, though they are not closely related to the ten species, or to each other. It is worth noting, however, that the two species with only 2 setae on the mentum (*C. ustulatus* and *C. murex*) are each highly distinctive in other respects.

Notes on Types

I have cited as holotypes those specimens which I have satisfied myself to be so, regardless of the manner in which they have been labelled or previously documented. I do not consider it necessary or advisable to designate uncited holotypes as lectotypes and I hope that those who do will accept my citations in lieu thereof. It has, however, proved necessary to designate one lectotype (for *C. humerosus* Pasc.) and one neotype (for *C. hopei* Fåhrs.).

The recognition of paratypes has sometimes proved difficult. In the case of Hope's material described by Fåhraeus, there are additional specimens of some of the species concerned both in Stockholm and in the Hope collection at Oxford. Although I have listed these specimens, I do not regard them as paratypes since the phrase ' Dom. Hope. Mus. Schh. ' indicates that the described specimens were retained in Stockholm and in any case the descriptions appear to have been based on the holotypes alone.

Pascoe frequently based his descriptions on a series of specimens (indicated by a range of lengths) but did not label the paratypes as such, so that they cannot now be distinguished from specimens acquired subsequently. Indeed, the presence of a determination label on a Pascoe specimen, other than the holotype, is a fair indication that the specimen is *not* a paratype. A further complication exists in Pascoe's case, owing to the fact that he examined A. Fry's material of *Catasarcus* about the time his paper was published and many Fry specimens named by Pascoe were labelled ' TYPE ' by Fry. Most of these specimens were obtained by Fry direct from du Boulay and were almost certainly seen by Pascoe after his paper was completed. Two of them, however, were obtained by Fry from Pascoe at this time and I have accepted these as paratypes (see p. 429).

Terminology

The terms herein used are mainly those of Marshall, except that *segment* replaces *joint* and *interstria* is preferred to *interval*. The areas between successive strial punctures are *gaps*; these and the interstriae taken together are the elytral *interspaces*. The term *stria*, in relation to the elytra, is purely locational and does not imply the presence of an impressed line; where such lines are present, the striae are described as *impressed*.

To avoid confusion, the fifth tarsal segment is called the *claw segment* and abdominal sternites 3–7 are referred to as *ventrites* 1–5. In the males of some non-spiny species there is a fairly well defined depression on ventrite 1 behind each hind coxa; these are the *post-coxal cavities*.

In some species, the apex of the rostrum is abruptly expanded ventrally; this expansion is referred to as the *chin*, from its appearance in profile view (Text-fig. 8). On either side of the epistome, usually near the anterior margin, are its *flanking setae*. Any setae on the corbellar plate are called *adventitious setae* on account of their irregular appearance.

Scales are *sparse* when clearly separated from each other, *dense* when subcontiguous, *tessellate* when pressed together (without overlapping) so as to obscure completely the underlying cuticle and *imbricate* when they overlap strongly; they may be in close contact with the cuticle (*appressed*) or raised up from it (*loose*). The scales collectively, together with the clothing setae, constitute the *vestiture*.

The aedeagus is *terete* when subcircular in transverse section; its subterminal orifice is the *phallotreme*. The halves into which the apex of the ovipositor is divided are its *valves*.

Carinae, etc. are *arched* when convex in profile view. The frons is convex when the middle is higher than the sides but level longitudinally; when the middle is also arched, the frons is said to be dome-shaped. The term *triangular* denotes an equilateral triangle. The prefix *micro-* is applied to states or structures only clearly visible under a magnification of *c.* × 125.

Colours are described as they appear under a binocular microscope, using high voltage illumination and a bull's-eye condenser. Scales described as *bronzy* are brown with a metallic sheen.

Identification

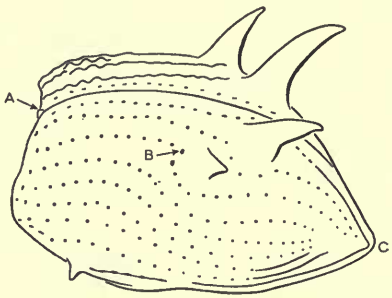
In addition to differences between the sexes (p. 364), many species exhibit great variation in size, sculpture and vestiture. Their appearance may also be altered by the presence of powdery exudate or as a result of bleaching (p. 364). At the same time, the differences between species may be slight or subtle so that correct identification by comparison *alone* is often impossible.

The various body proportions given in the key and descriptions were measured under a microscope using an eyepiece scale. The proportions of the prothorax and elytra are given with the length first, corrected to 10 in each case. This makes all the ratios comparable and avoids the use of figures less than unity for the elytral width. As the true elytral length is difficult to measure accurately, the line from the scutellum to the apex is used instead (see AC in Text-fig. 1). The proportions of antennal funicle segments 1–3 are given with 3 (the shortest) corrected to 1 in each case. These proportions vary considerably in each species, and mean figures, not ranges, are therefore given. The stated number of specimens from which the means are derived should be taken into account when comparing them with fresh data. The length of the rostrum was taken from the level of the anterior margins of the eyes to the longer of the two genae or the margin of the epistome if this were longer.

A very useful datum for identifying certain quadrispinate species is what I have called the *anterior spine index* (see Text-fig. 1). The measurements must be accurately made, using an eyepiece scale and taking care to incline the specimen so as to bring the points being measured into the same focal plane, thus ensuring true (maximum) readings. As the base of the spine is ill-defined, measurement AB is made to the

centre of the nearest strial puncture; if there is no puncture near the line of measurement, the position is obtained by estimation. A table of these indices is given on p. 423.

The aedeagus is sometimes important in identification and should be examined wherever possible. Both the aedeagus and the ovipositor can, with care, be drawn out of a fully relaxed specimen with watchmaker's forceps without damaging the specimen, especially if they are allowed to remain *in situ*.



$$\frac{AB}{AC} \times 100 = \text{anterior spine index}$$

FIG. 1. *Catasarcus spinipennis* Fåhraeus ♂. Elytra, showing how anterior spine index is obtained.

As stated earlier, it is difficult to divide the species of *Catasarcus* into groups morphologically. Nevertheless, in the key to species I have attempted to group the non-spiny species according to the condition of the frontal carinae. This may make the couplets concerned difficult to interpret but it avoids bringing out all the species *seriatim*, which would make the key very tedious to use. To allow for variation in the carinae and other characters, several species have been brought out in more than one place. Some indication of the range of each species, where known, is given in the key; this will often serve to confirm determinations. Estimates of frequency would, for the most part, be meaningless but I have marked four species as '*Common*'; this is partly to prevent a wrong impression being gained from the fact that one of the four is new.

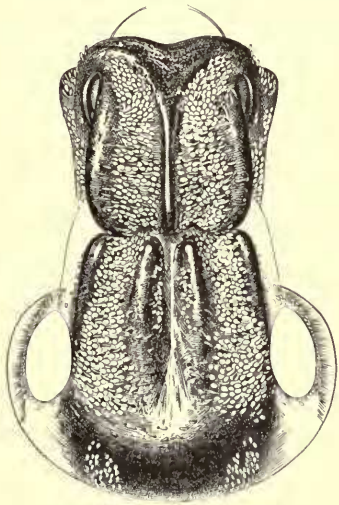
KEY TO THE SPECIES OF *CATASARCUS*

(Except *C. albuminosus*)

1		Elytra with dorsal spines 36
–		Elytra without dorsal spines 2
2	(1)	Head with 4 distinct longitudinal carinae on frons 4
–		Head without distinct frontal carinae 3
3	(2)	Frons convex, with median longitudinal cleft anteriorly; median rostral carina very strongly raised and projecting posteriad over the very short but deep transverse basal furrow; dorsum densely squamose. *W. A., near Busselton* ***ustulatus*** sp. n. (p. 388)
–		Frons flat, with shallow median sulcus; transverse basal furrow similarly shallow: median rostral carina not strongly raised or projecting posteriad; dorsum bare. *S. A., east of Lake Eyre* . . ***memnonius*** Pascoe (p. 422)

4 (2) Frontal carinae all well developed, equidistant from each other and straight (or almost so) (Text-fig. 2); lateral carinae parallel or weakly converging anteriorly; (admedians often broader than laterals but then well separated by deep median sulcus); length rarely < 8 mm. *W. A., central and southern parts, east of Albany* 5

– Frontal carinae either all poorly developed, or one pair differing markedly from the other in size, shape, or both (Text-figs. 3–5) (if not markedly different, then admedians closer to each other than to laterals) 8



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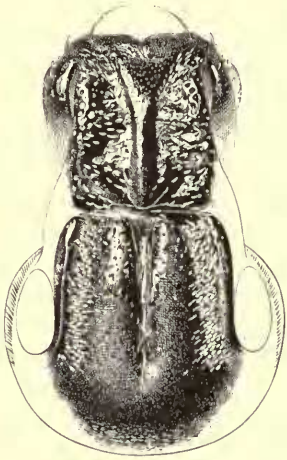

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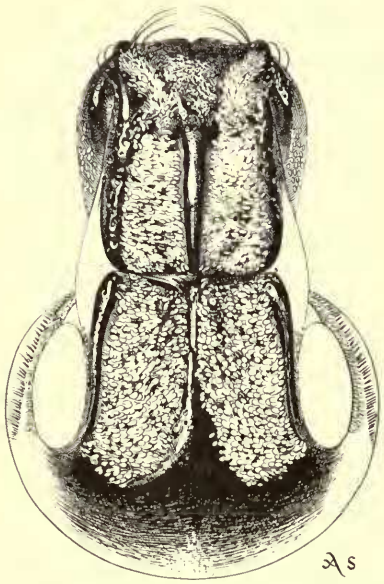

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FIGS. 2–5. *Catasarcus* spp. Head in dorsal view to show frontal carinae. 2, *C. obesus* sp. n. 3, *C. hopei* Fåhraeus. 4, *C. impressipennis* (Boisduval). 5, *C. opimus* Pascoe.

5 (4) Hind femora distinctly curving upwards near base (Text-fig. 10); pronotum with pair of small pale admedian scale-patches near anterior margin; scales on elytra mostly yellowish, on legs and underside of head bluish white with coppery reflection; rostrum not, or scarcely, longer than broad, epistome large and flat and making an acute angle with mentum. *Esperance area* ***varus*** sp. n. (p. 386)

– Hind femora almost straight in profile view (Text-fig. 11); pronotum without small pale spots; elytra variegated, or with mostly whitish scales; scales on underside of head whitish (rarely bright blue), without coppery reflection . 6

6 (5) Elytra elongate-ovate (10 : < 7); fore femora strongly swollen; legs with small vivid metallic blue or green scales, knees black; underside of head with narrow tract of pure white (or vivid blue) scales below eye. *Inland, north-east of Albany* . . . . . ***azureipes*** sp. n. (p. 385)

– Elytra subglobose (10 : > 7); fore femora normal; femora and underside of head with dense whitish scales throughout 7

7 (6) Elytra with areas of yellow, white and grey scales forming an irregular pattern; strial punctures very regular, mostly pupillate; prothorax less strongly transverse (10 : < 18). *Wialki–Nulla Nulla area* . ***aspergetus*** sp. n. (p. 383)

– Elytra without yellow scales, strial punctures less regular, not pupillate; prothorax more strongly transverse (10 : > 18). *Southern Cross–Ravensthorpe area* . . . . . ***obesus*** sp. n. (p. 382)

8 (4) Admedian frontal carinae as long as lateral carinae, much closer to each other than to laterals and raised above them (if shorter, or not distinctly higher than laterals, then knees black and frons without any median elevation); humeral tubercle usually sharp, post-humeral tubercle smaller than humeral tubercle, or obsolete; interstriae smooth. *Esperance–Hopetoun area, inland to Widgiemooltha* . . . . . ***carinaticeps*** Lea (p. 400)

– Characters not so combined 9

9 (8) Admedian frontal carinae as long as, and distinctly broader than, the lateral carinae (Text-figs. 3, 4). *W. A.* 10

– Admedian carinae otherwise 20

10 (9) Hind femora distinctly curving upwards near base (Text-fig. 10); epistome clearly defined, triangular, flat or weakly convex. *Esperance area* ***varus*** sp. n. (p. 386)

— Hind femora almost straight in profile view (Text-fig. 11); epistome usually elongate or with disc depressed 11

11 (10) Epistome elongate, merging gradually with median rostral carina in both dorsal and profile view; admedian frontal carinae and median rostral carina usually strongly raised, bare and shiny; antennae with funicle segments 4–7 scarcely longer than broad. *Albany and extreme south-west* . ***hopei*** Fåhraeus (p. 397)

— Characters not so combined 12

12 (11) Prothorax twice as broad as long (♀); elytra in ♀ globose (Text-fig. 34), almost smooth; striae not, or weakly, impressed, punctures small (diameter often < ½ width of interstriae); scales fairly evenly distributed. *Tammin* . . ***sericeus*** Blackburn (p. 396)

— Prothorax less strongly transverse (10 : < 18); elytra less strongly inflated, often granulose-rugose; punctures larger (diameter at least = width of interstriae) or striae strongly impressed, or both; scales concentrated in depressions 13

13 (12) Legs with tarsi black above (difficult to see when scales are dense). *Mainly north of Bunbury* 14

— Legs unicolorous, red (sometimes very dark). *Mainly south of Bunbury* . . 17

14 (13) Antennae with funicle segments 5–7 not, or scarcely, longer than broad, club ovate; mentum with 4 setae; head with no broad scales below eye. *Around Perth* . . . . . ***cygnensis*** sp. n. (p. 412)

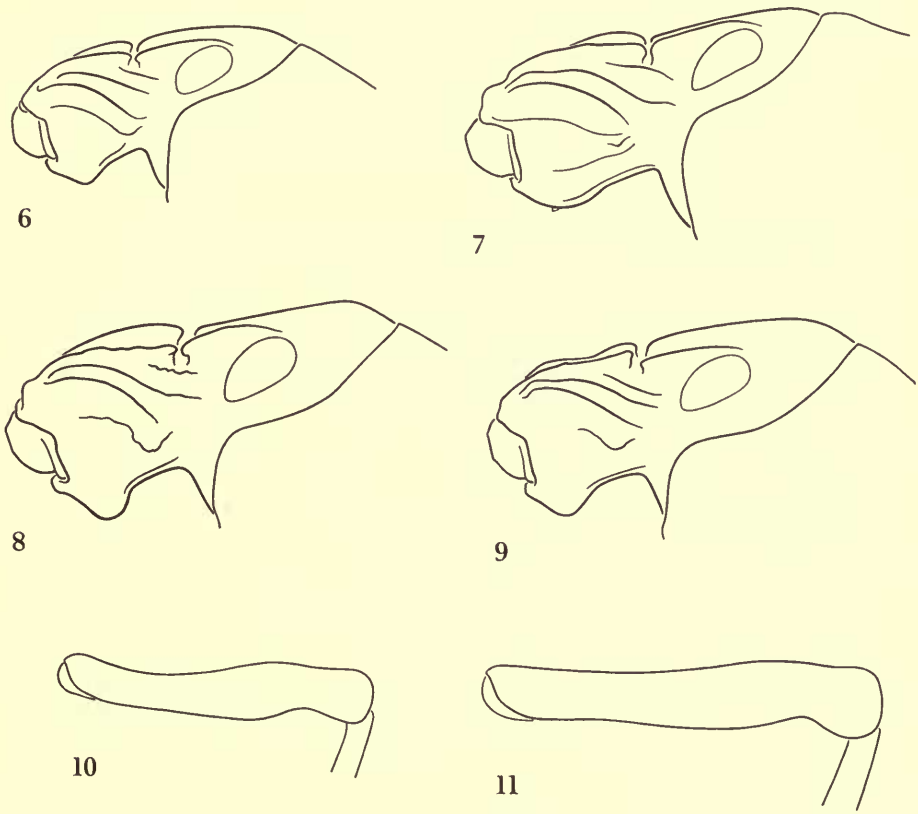
— Antennae with funicle segments 5–7 distinctly longer than broad, club fusiform; mentum with at least 6 setae 15

15 (14) Epistome merging with median rostral carina in profile view (ignoring any constriction between the two), convex; admedian frontal carinae as long as laterals and close together. *Hill River area*
pallidiventris sp. n. (p. 406)

— Epistome weakly but abruptly declivous in profile view, flat 16

16 (15) Epistome with numerous (*c.* 8–10) flanking setae on each side; scales below eye usually narrow and separate; length < 19 mm. *Around Perth. Common*
asphaltinus sp. n. (p. 407)

— Epistome with few (*c.* 4) flanking setae; scales below eye broader, contiguous or imbricate; length probably not > 14 mm. *Range uncertain*
longicornis Pascoe (p. 411)



FIGS. 6–9. *Catasarcus* spp. Outline of head in profile view (antennae omitted). 6, *C. hopei* Fåhraeus. 7, *C. asphaltinus* sp. n. 8, *C. bilineatus* Fåhraeus. 9, *C. aerosus* sp. n.

FIGS. 10–11. *Catasarcus* spp. Outline of left femur in profile view. 10, *C. varus* sp. n. 11, *C. obesus* sp. n.

17 (13) Head with patch of scales below eye, admedian frontal carinae straight; dorsal area of rostrum with scales concentrated at posterior end. *Around Cape Naturaliste* . . . . . ***coruscus*** sp. n. (p. 414)

— Head without, or with very small filiform scales below eye (not forming a patch); all frontal carinae usually more or less curved 18

18 (17) Elytra with interstria 7 about twice as wide as 6 (Plate 1, Figs. 3, 4). *Range unknown* . . . . . ***inaequalis*** sp. n. (p. 421)

— Elytra with interstriae 6 and 7 subequal 19

19 (18) Prothorax with narrow tract of imbricate scales at sides, extending from anterior constriction to hind angle; elytra less elongate (♂, 10 : 6·5–6·7), interspaces convex and smooth. *Manjimup* . . . . . ***laevior*** sp. n. (p. 417)

— Prothorax without imbricate scales at sides between anterior constriction and hind angle; elytra more elongate (♂, 10 : 5·8–6·5), interspaces flat and uneven or convex and weakly rugose. *Extreme south-west, mainly around Albany. Common* . . . . . ***impressipennis*** (Boisduval) (p. 417)

20 (9) Post-humeral tubercle of elytra < segment 3 of antennal funicle, or represented by a smooth bulge, or absent 29

— Post-humeral tubercle > segment 3 of funicle; rostrum with distinct chin (Text-figs. 8, 9) 21

21 (20) Elytra with well marked sutural stripe of pale scales; rostrum with median carina raised, arched, bare and shiny; lateral frontal carinae narrow, parallel or weakly converging anteriorly; admedian carinae about half as long as laterals (often ill-defined). *W. A., west coastal region* 22

— Elytra rarely with any trace of a sutural stripe, lateral frontal carinae distinctly converging anteriorly 23

22 (21) Frons flat, epistome with numerous large flanking setae and smaller setae on disc; form more elongate (elytra in ♂ 10: 6·4–6·8); vestiture of pronotum uniform. *Wide area around Perth, inland to Beverley. Common*

bilineatus Fåhraeus (p.393)

— Frons convex, epistome with 3–6 large adherent flanking setae and a similar number of much smaller, separate, setae mesal of these but scarcely any on disc; form less elongate (elytra in both sexes *c.* 10 : 7); pronotum with two broad, ill-defined pale stripes or admedian patches. *Moore River*

latheticus sp. n. (p. 393)

23 (21) Post-humeral tubercle of elytra distinct but small (< segment 2 of antennal funicle) and sharp. *In or near Perth* 24

— Post-humeral tubercle large (> segment 2 of funicle) or represented by a large obtuse bulge; length seldom > 11 mm. 25

24 (23) Epistome with one tuft of adherent flanking setae (appearing as a single seta) on either side; dorsal area of rostrum narrow at base, usually progressively widening apically; median rostral carina depressed in middle (Text-fig. 9); lateral frontal carinae strongly converging anteriorly; legs slender, tibial teeth small. *Bejoording–Lancelin area* . . . . ***aerosus*** sp. n. (p. 390)

— Epistome with several separate flanking setae; dorsal area of rostrum usually distinctly narrower at apex than at base (sometimes lyre-shaped); median rostral carina usually level (sometimes depressed in middle); lateral frontal carinae less strongly converging anteriorly; legs stout, tibial teeth large. *Perth—Gingin area* . . . . . ***griseus*** Pascoe (p. 391)

25 (23) Prothorax very strongly transverse (10 : > 24), sides almost straight, very strongly converging anteriorly (Text-fig. 31); elytra globose; antennae with segment 1 of funicle scarcely longer than 2. *W. A., around Esperance*

bakeri sp. n. (p. 381)

— Prothorax less strongly transverse; funicle with segment 1 distinctly longer than 2 26

26 (25) Epistome narrow, flat, weakly arched and continuous with median rostral carina in profile view, with several recumbent squamiform or normal setae posteriorly. *Eastern Australia* . ***transversalis anatolicus*** ssp. n. (p. 380)

— Epistome broad, triangular, disc more or less depressed, bare 27

27 (26) Scales immediately in front of eye smaller and narrower than those below eye 28

— Scales immediately in front of eye similar or identical to those below eye; elytra with post-humeral tubercle very large and blunt or represented by a broad bulge, completely covered with scales; disc of elytra with weak transverse folds; scales mostly pearly but with heavy deposit of yellow-brown powdery exudate. *W. A., around Albany, inland to Borden* . ***rugulosus*** Boheman (p. 389)

28 (27) Form broader (elytra 10 : 7·2–8·1); elytra usually with strong continuous sinuous transverse folds; median rostral carina usually strongly raised and projecting posteriad over transverse furrow; epistome with 1 or 2 small flanking setae; setae on femora small dark and inconspicuous. *Eastern Australia* ***transversalis*** Germar (p. 377)

— Form less broad (elytra 10 : 6·8–7·3); elytra without, or with weak transverse folds; median rostral carina not strongly raised or projecting posteriad; epistome with several separate flanking setae; setae on femora large, pale and conspicuous. *W. A., Perth–Gingin area* . . . . ***griseus*** Pascoe (p. 391)

29 (20) *Mainly west of Albany* 30

— *Mainly east of Albany* 5

30 (29) Knees black, fore femora strongly swollen 31

— Knees red (sometimes infuscate or with black spots but never entirely black), fore femora swollen or not 32

31 (30) Corbel tapering to a point at dorsal end; elytra finely granulate throughout, strial punctures ill-defined or irregular; ventrite 5 with transverse carina (sometimes obsolete in ♀); frons densely squamose (scales completely covering admedian carinae) and usually with a narrow wedge-shaped median carina (Text-fig. 5); pronotum coarsely granulo-rugose; femora sparsely squamose. *Between Perth and Geraldton* . . . . . ***opimus*** Pascoe (p. 404)

— Corbel not tapering to a point dorsally; elytra without granules; strial punctures well defined, regular, picked out with white scales; all interspaces equally convex, forming a very regular reticulum (mesh pattern); frons less densely squamose; femora (at least in part) with vivid metallic blue or green scales. *Inland, north-east of Albany* . . . . . ***azureipes*** sp. n. (p. 385)

32 (30) Median rostral carina depressed in middle (*not* at junction with epistome) (Text-fig. 9); post-humeral tubercle always present, sharp; lateral frontal carinae strongly converging anteriorly; length < 13 mm. *Bejoording–Lancelin area* . . . . . ***aerosus*** sp. n. (p. 390)

— Median rostral carina level or arched; post-humeral tubercle often blunt or absent; lateral frontal carinae not, or weakly, converging anteriorly . . 33

33 (32) Epistome with numerous (*c.* 8–10) flanking setae on either side, poorly defined, flat and weakly but abruptly declivous; interstriae of elytra flat or weakly convex, rugose; apex of elytra in male finely rugose, appearing shrivelled. *Wide area around Perth. Common* . . . . ***asphaltinus*** sp. n. (p. 407)

— Epistome with 2–4 flanking setae 34

34 (33) Frons flat, admedian frontal carinae completely covered with loose imbricate scales; centre of frons usually with very narrow cariniform elevation which widens posteriorly and merges with vertex. *Toodyay–Merredin area* ***frontalis*** sp. n. (p. 402)

— Frons weakly convex, admedian frontal carinae not completely covered with scales; centre of frons without any cariniform elevation 35

35 (34) Epistome convex, merging with median rostral carina in profile view (ignoring any constriction between the two); scales in front of eye *c.* × 2·5–5 as long as broad, < half as wide, on average, as scales below eye; size and form as in *C. asphaltinus*. *Hill River* . . . . . **.*pallidiventris*** sp. n. (p. 406)

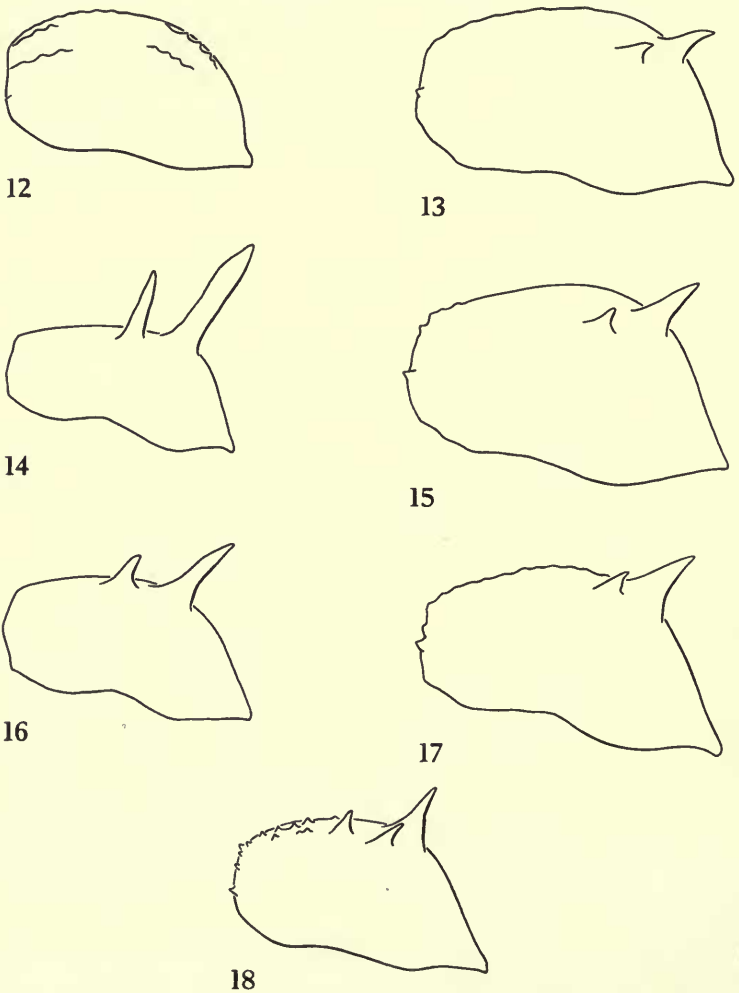
— Epistome flat, weakly but abruptly declivous; scales in front of eye × 1·5–3 as long as broad, on average > half as wide as scales below eye; length probably not > 14 mm. *Range uncertain* . . . . . ***longicornis*** Pascoe (p. 411)

36 (1) Elytra with 6 or more dorsal spines or large tubercles (Text-figs. 18–22) . . 47

— Elytra with fewer than 6 dorsal spines (Text-figs. 13–17, 23). *W. A.* . . . 37

37 (36) Pronotum dark red, head and elytra black. *West coast, north of Geraldton* . 38

— Pronotum black or brown, concolorous with head and elytra 39



FIGS. 12–18. *Catasarcus* spp. Outline of left elytron in profile view. 12, *C. memnonius* Pascoe ♂. 13, *C. intermedius* Pascoe ♀. 14, *C. albipectus* sp. n. ♂. 15, *Idem* ♀. 16, *C. echidna* Pascoe ♂. 17, C. *spinipennis* Fåhraeus ♀. 18, *C. concretus* Pascoe ♂.

38 (37) Form more elongate (prothorax 10 : 14·7–16·7, elytra 10 : 6·8–7·6); ♂ with posterior dorsal spines very long and cylindrical (Text-fig. 14), post-humeral spine represented by a small sharp tubercle, or obsolete; disc of elytra without discrete scale-patches. *Murchison River Reserve* . ***albipectus*** sp. n. (p. 425)

— Form less elongate (prothorax 10 : 16·5–17·3, elytra 10 : 7·4–8); both sexes with dorsal elytral spines tapering throughout their length; post-humeral spine normal; disc of elytra with discrete, but irregular, scale-patches. *Between Geraldton and Murchison River* . . . . . ***bicolor*** sp. n. (p. 427)

39 (37) Corbels squamose; eyes round (× 1·2 as long as broad), very strongly convex, completely encircled with white scales; disc of pronotum very strongly rugose, with impressed median line. *Geraldton—Shark Bay area* ***carbo*** Pascoe (p. 447)

— Corbels without scales; eyes more elongate, less strongly convex, not, or incompletely, encircled with white scales; disc of pronotum less strongly rugose than sides 40

40 (39) Dorsal elytral spines black 41

— Dorsal elytral spines red or dark red 42

41 (40) Head with lateral frontal carinae absent, admedian carinae very small, tuberculiform; usually each dorsal elytral spine ascended by a tract of pale scales. *Bejoording–Lake Grace area* . . . . ***marginispinis*** Pascoe (p. 436)

— Head with lateral frontal carinae distinct; dorsal elytral spines bare or with uniform small dark scales. *Around Geraldton* . . ***echidna*** Pascoe (p. 428)

42 (40) Elytra with interstriae 2 and 3 each with a small sharp shiny forwardly-projecting tubercle at base (projecting beyond base), vestiture brown with a pale flash at sides; prothorax transverse but barrel-shaped. *?Geraldton area* ***cicatricosus*** Pascoe (p. 440)

— Elytra without, or with different tubercles at base 43

43 (42) Corbels densely setose (> 20 setae on plate); transverse rostral furrow shallow; post-ocular lobes of prothorax rather sharply angulate; antennal club short and stout (2 : 1); dorsal elytral spines small (anterior pair sometimes obsolete) and set further back (Text-fig. 13). *Between Carnarvon and North West Cape* . . . . . ***intermedius*** Pascoe (p. 424)

— Corbels with < 20 adventitious setae; transverse rostral furrow deep; post-ocular lobes not, or weakly, angulate; antennal club more elongate; dorsal spines, on average, larger and set further forward on elytra . . . 44

44 (43) Prothorax subcylindrical (10 : < 16); scales forming a black and white pattern (Text-fig. 58) (dorsal elytral spines red). *?Geraldton area* ***albisparsus*** Pascoe (p. 436)

— Prothorax much broader at base than at apex (10 : > 16); scales, if white, not forming a pattern 45

45 (44) Elytra with anterior dorsal spines evidently nearer base in ♂ than in ♀; base of interstria 3 with large smooth shiny callus or large granule; head with lateral frontal carinae usually extending over top of eye. *Around Geraldton* ***echidna*** Pascoe (p. 428)

— Elytra with dorsal spines not evidently nearer base in ♂ than in ♀, base of interstria 3 simple or, if with large granule, then several other similar but smaller granules present in humeral region; head with lateral frontal carinae stopping short before eye (and often obscured by scales) 46

46 (45) Aedeagus with transverse wrinkles below phallotreme; majority of scales on tarsi brown (with metallic reflections); elytra typically with patches of pearly or coppery scales on a dark background and usually without granules. *Perth–Hill River area* . . . . . ***nephelodes*** sp. n. (p. 431)

— Aedeagus without any wrinkles below phallotreme; majority of scales on tarsi whitish or pearly; elytra typically with large whitish scales throughout

and often granulose. *Perth area, including off-shore islands, north to Yanchep, south to Pemberton. Common* . . . ***spinipennis*** Fåhraeus (p. 443)

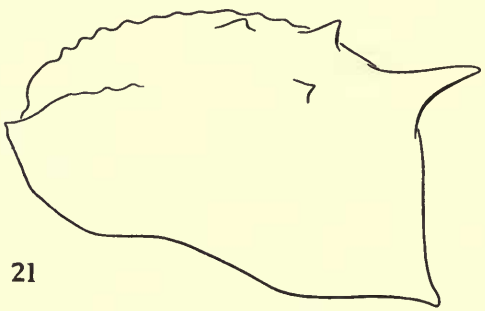
47 (36) Head with lateral frontal carinae distinct; each elytron with 1 large spine at top of declivity and 3 smaller spines (very small in ♀) on disc (Text-fig. 21); humeral tubercle large in ♀, absent in ♂. *Kalgoorlie, W. A., to Fowler's Bay, S. A., inland to Ayer's Rock, N. T.* . . . ***armatus*** Blackburn (p. 443)

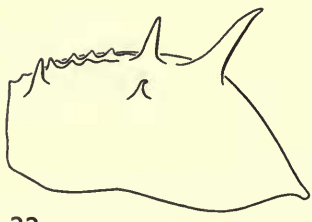
— Head with lateral frontal carinae indistinct or absent. *W. A.* 48

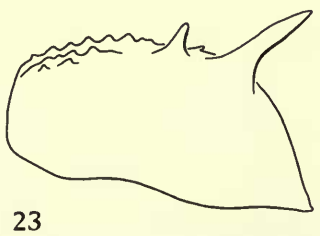
48 (47) Prothorax dark red; eyes × 1·5 as long as broad, very weakly convex; each elytron with 4 large dorsal spines, including one in interstria 4 between middle and base (Text-figs. 19, 20). *Bridgetown–Lake Grace area* ***murex*** sp. n. (p. 441)

— Prothorax concolorous with head and elytra; eyes < × 1·3 as long as broad, moderately to very strongly convex; elytral spines otherwise 49

49 (48) Corbels squamose; pronotum more strongly rugose on disc than at sides, anterior border with bifid median swelling; elytra without a small sharp tubercle at base of interstria 3 50







FIGS. 19–23. *Catasarcus* spp. Outline of left elytron in profile view. 19, *C. murex* sp. n. ♂. 20, *Idem* ♀. 21, *C. armatus* Blackburn ♀. 22, *C. lepidus* Pascoe ♂. 23, *C. carbo* Pascoe ♂.

— Corbels without scales; pronotum less strongly rugose or granulate on disc than at sides, anterior border not swollen; elytra with a small sharp tubercle at base of interstria 3, projecting anteriad beyond base. *Hopetoun* ***concretus*** Pascoe (p. 435)

50 (49) Eyes very strongly convex, broadly encircled with white scales; each elytron with 2 large dorsal spines posteriorly (Text-fig. 23). *Geraldton–Shark Bay area* ***carbo*** Pascoe (p. 447)

— Eyes less strongly convex, not, or very narrowly, encircled with white scales; each elytron with 3 large dorsal spines posteriorly and one near base, in interstria 5 (Text-fig. 22). *Range uncertain* . . ***lepidus*** Pascoe (p. 446)

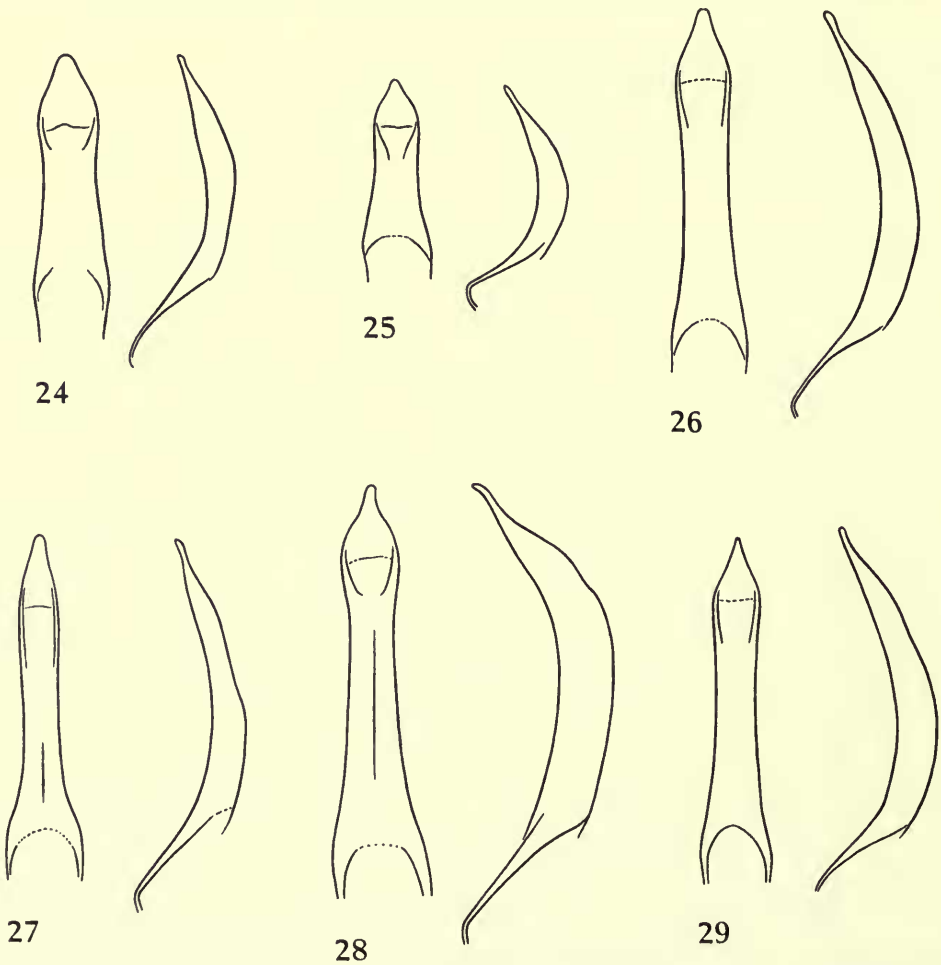
Catasarcus transversalis Germar **sp. rev.**

(Text-figs 24, 30, Map 2)

Catasarcus transversalis Germar, 1848 : 212.
Catasarcus transversalis Germar; Taschenberg, 1869 : 31.
Catasarcus transversalis Germar; Lacordaire, 1863 : 250 (note).
Catasarcus transversalis Germar; Pascoe, 1870 : 16, 25, 26.
Catasarcus transversalis Germar; Tepper, 1887 : 30.
Catasarcus stigmatipennis (Boisduval); Lea, 1918 : 265 [Erroneous synonymy].

Length 7·4–11·4 mm. Body black, legs and antennae dark red to black. Scales dense but easily abraded, mostly whitish, usually with pink of green reflection (rarely coppery); setae brown throughout; powdery exudate scanty or absent. *Head* with frons weakly to distinctly convex; frontal carinae very variable, laterals short, straight, subparallel to strongly converging anteriorly (rarely almost obsolete); admedian carinae straight or weakly curved, parallel with laterals or more strongly converging anteriorly, about equidistant from each other and from laterals, occasionally irregularly subdivided or with accessory carinulae; frons in mid-line even or with smooth elongate tectiform or rounded elevation; scales dorsally fairly dense and recumbent, mainly white on frons and olive-green on vertex (dense behind eyes) but white scales sometimes restricted to two ill-defined admedian tracts or a pair of dense patches just behind level of hind margins of eyes; scales below eyes pearly white, imbricate, becoming less dense towards mid-line. *Rostrum* × 1·1–1·2 as long as broad, distinctly widening apically; epistome broad with shallow discal depression accentuated by very low transverse subapical elevation, surface pitted and strongly microreticulate anteriorly, flanking setae as in *C. rugulosus* but one or two smaller setae near them and two more in median excision; median carina sharp, narrow in front becoming broader and tectiform behind and there moderately to very strongly raised (and often arched) and projecting strongly over the very deep transverse furrow with an oblique carina supporting the projection on either side; dorsal area rectangular to lyre-shaped, lateral sulci sometimes deep; sparsely to densely squamose throughout. *Antennae* with lengths of funicle segments 1–3 in ratio 2 : 1·5 : 1 (mean of seven), 4–6 slightly shorter than 3, subequal, 7 ≏ 3 and about × 1·3 as long as broad. *Prothorax* very strongly transverse (10 : 19·3–23·9), broadest in basal half, sides rounded, strongly converging anteriorly; post-ocular lobes fairly well developed; upper surface smooth to obscurely granulate, sides distinctly to strongly granulate; transverse striae strongly impressed, usually complete but often irregular; scales below and at sides dense, often partly imbricate; scales above less dense (sometimes very sparse) but usually with small pale spot on posterior stria at either side and pair of admedian patches, also on posterior stria as in *C. rugulosus* (but less well defined). *Scutellum* smooth, punctured, with variable number of elongate and filiform scales. *Elytra* shortly ovate-acuminate, globose in some females (10 : 7·2–8·1); humeral tubercle basal, well developed, forwardly directed and sharp in female, blunt or obsolete in male; interstriae 2, 3 and 5 often slightly raised at base; post-humeral tubercle large, conical or subparallel-sided, blunt, strongly reflexed ventrad and sometimes posteriad; striae impressed throughout; strial punctures large and deep near sides,

becoming smaller towards suture; interstria 1 sometimes flattened and depressed on disc, otherwise elytral interspaces strongly raised, forming a reticulate pattern or, more often, a series of high sinuous undulating transverse folds, mostly continuous across full width of each elytron; scales very dense on interstriae 9 and 10 (except underside of post-humeral tubercle) and on interstria 1 when depressed, elsewhere less dense and fairly uniform but transverse folds often bare or with inconspicuous brown scales which may predominate on declivity. *Legs* rather slender; femora scarcely swollen; fore and middle tibiae very weakly curved, with moderate teeth; hind tibiae straight, with unequal teeth, corbels narrow with nought to many adventitious setae; femora usually with dense large round scales ventrally and at apex and sparse small elongate scales elsewhere (sometimes with large scales throughout); tibiae and tarsi with dense, mainly brown scales throughout. *Underside* densely squamose; ventrites 1 and 2 with small scattered granules, strongly raised and bead-like, especially in male; post-coxal cavities linear or obsolete; suture between ventrites 1 and 2 distinct throughout its length. *Aedeagus* (Text-



FIGS. 24–29. *Catasarcus* spp. Aedeagus in dorsal and lateral view. 24, *C. transversalis* Germar. 25, *C. bakeri* sp. n. 26, *C. obesus* sp. n. (Lake Carmody). 27, *C. rugulosus* Boheman. 28, *C. griseus* Pascoe. 29, *C. varus* sp. n.

fig. 24) short, depressed, rather strongly curved, terete, smooth, except for numerous fine scattered granules on underside of apex; apical region short, tip broadly rounded, not usually deflexed. *Ovipositor* with valves somewhat depressed, together broader than high but each smoothly rounded and not at all explanate.

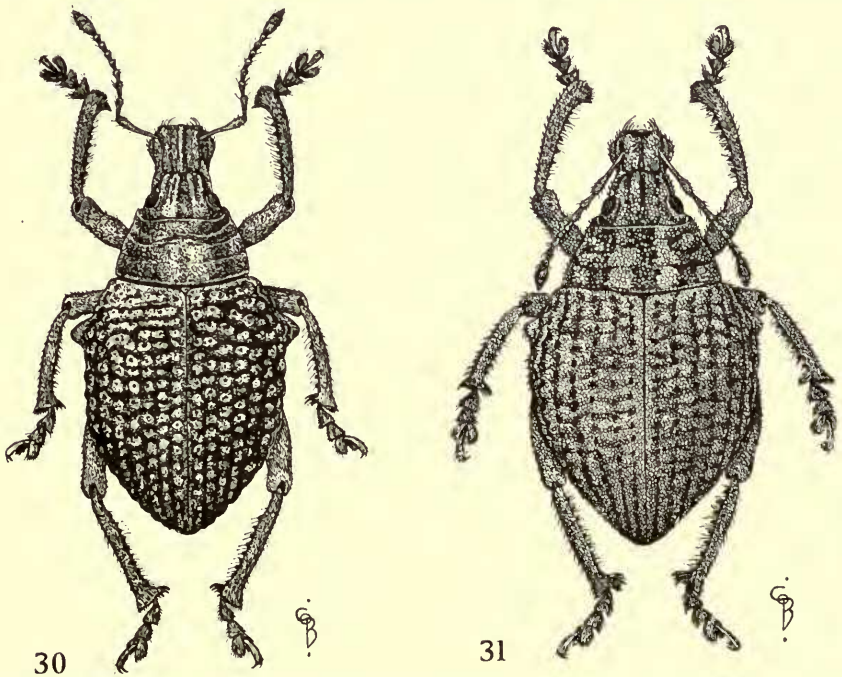
Holotype ♂, Adelaide, [1844–45 (*H. H. Behr*)], in Zoologisches Institut, Martin Luther Universität, Halle. Unique (see Taschenberg, 1869 : 31).

Over 130 specimens seen.

Localities: SOUTH AUSTRALIA: Kangaroo I. (Kelly's Hill Caves); Yorketown; Adelaide; Victor Harbour; Gawler; Nuriootpa; Barossa; Murray Bridge; Tintinara; Lucindale. VICTORIA: Yanac; Kiata; Gypsum. See map 2.

A record for Newcastle, N.S.W. (Frey) is known to be false and a specimen from the Pascoe collection (BM (NH)) with ' Champion B. ' must also be wrongly labelled. A recent record for Alice Springs, N.T. (xii.1955, *W. B. H*[*itchcock*]) (V) must, if genuine, almost certainly be a transported specimen.

Host-plants: *Hakea rostrata* (Tintinara, 6.i.1887 (*Tepper*) (A)). Further host-plants are mentioned by Tepper (1887 : 30) with other interesting observations: ' *Catasarcus transversalis*, Germar, is one of the commonest beetles in the scrub during spring and summer . . . The beetles feed on the leaves of various kinds of Leptospermum, Melaleuca (tea-trees) and shrubs. When alarmed they drop down at once '. The last observation is also reported by Wilson (p. 363, above).



FIGS. 30, 31. 30, *C. transversalis* Germar ♂. 31, *C. bakeri* sp. n. ♀.

Lea's erroneous synonymy of this species with *C. stygmatipennis* is discussed on p. 420. In spite of some misgivings, Pascoe identified this species correctly.

The nominate subspecies, described above, can usually be distinguished from all other forms by the strongly raised, sharp, beak-like median rostral carina and the very strong transverse folds on the elytra.

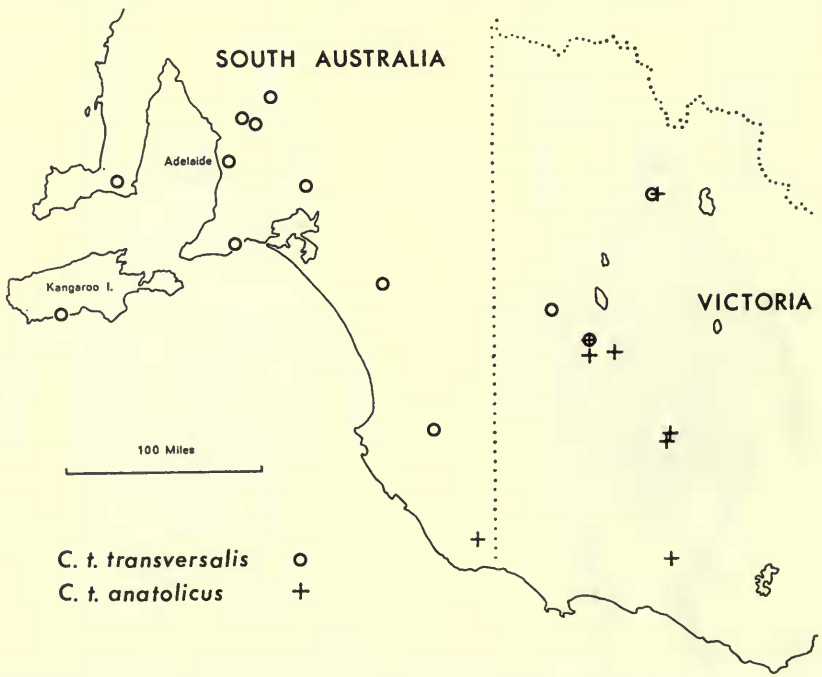
Catasarcus transversalis anatolicus ssp. n.

(Map 2)

Length 7·3–10 mm. Distinguished from the nominate subspecies as follows. *Head* with admedian frontal carinae usually closer to each other than to laterals, median sulcus often reduced to a short cleft (frons then dome-shaped). *Rostrum* with epistome usually longer than broad, flat, arched, seldom with any subapical elevation, disc with a small number of squamiform setae posteriorly and not well defined from median carina which is evenly and less strongly raised. *Prothorax* slightly less transverse (10 : 18·5–20·6); transverse striae less strongly impressed (anterior often obsolete); scaling more uniform. Elytra with weaker transverse folds, often smooth or regularly granulate with strongly impressed striae. *Legs* almost always quite black; femora densely squamose throughout. *Aedeagus* as in *C. t. transversalis* except that both specimens examined have dorsal margins carinate almost to base.

Holotype ♂. VICTORIA: Warnambool, Teatree Creek, 9.x.1964, in the National Museum of Victoria, Melbourne.

Paratypes. 2 ♂, Grampians (det. Lea, vii.1904) (V); 1 ♀, same locality, 1934; 2 ♂, Hall's Gap (all *K. Guichard*) (all Manchester); 1 ♀, Kiata, 29.xii.1918 (*F. E.*



MAP 2. *Catasarcus t. transversalis* Germar and *C. t. anatolicus* ssp. n. Distribution.

Wilson) (A); 1 ♀, ditto but 31.xii.1918 (FEW); 1 ♂, ditto but 23.xi.1952 (BM (NH)); 1 ♂, Little Desert, 9 mls. S. of Kiata, x.1948 (*A. Musgrave*) (A); 1 ♂, 2 ♀, Little Desert, 17–25.x.1952 (*E. M[atheson]*) (2 V, 1 BM(NH)); 1 ♀, same locality, 23.x.1946 (*A. B[urns]*); 1 ♂, Gypsum (*C. Oke*); 1 ♂, Dimboula (all V); 1 ♂, 1 ♀, without data (V); 1 ♂, Mount Gambier, 29.x.1957 (*W. M. M[oore]*); 1 ♀, ditto but 1.xii.1957 (both V); 1 ♂, 1 ♀, ' S. Australia ' (BM(NH), V). Total: 22 specimens.

Localities: SOUTH AUSTRALIA: Mount Gambier. VICTORIA: Kiata; Little Desert; Dimboula; Gypsum; Grampians; Hall's Gap; Teatree Creek (near Warnambool). See Map 2.

In the specimen from Dimboula and one of those from Kiata, the elytra have a high proportion of golden scales, especially at the base and along interstria one (the suture). In some other specimens, notably those from Mount Gambier, there is a heavy deposit of yellow powdery exudate.

The most easterly representative of the genus. The ranges of the two subspecies appear to meet and possibly overlap in the region of the Little Desert. They were taken together at Kiata in 1918 and have both been taken at Gypsum (on separate occasions). The nominate subspecies was also taken in the Little Desert (without precise location) by W. van der Starre in 1964 (FHUB, BM(NH)).

Catasarcus bakeri sp. n.

(Text-figs. 25, 31, Map 4)

Length 6·2–9·1 mm. Body black, legs and antennae dark red to black. Scales dense, mostly whitish or pearly; setae brown throughout; no powdery exudate observed. *Head* with frons as in *C. rugulosus*; scales large and dense throughout, imbricate below eye, mostly white or pearly but usually brown on vertex; eyes almost flat, suboblong, × 1·5 as long as broad. *Rostrum* × 1·1–1·3 as long as broad, distinctly widening apically; epistome smaller than in *C. rugulosus*, disc flat, more coarsely pitted and often without evident microsculpture; two (apparently one) flanking setae; median carina narrow, often depressed in middle; dorsal area rectangular or broadest at junction with upper margin of scrobe; chin fairly well defined, sharp; rather densely squamose throughout. *Antennae* with lengths of funicle segments 1–3 in ratio 1·7 : 1·5 : 1 (mean of five), 3–7 subequal (3 and 7 usually longest). *Prothorax* very strongly transverse (10 : 24·3–26·3), broadest at base, sides almost straight, very strongly converging anteriorly; post-ocular lobes poorly developed; upper surface smooth, with a few scattered punctures but no granules; sides finely rugose with at most a few obscure granules; transverse striae as in *C. rugulosus*, sometimes strongly impressed, producing between them a well marked transverse fold; scales very dense or imbricate below and at sides, less dense above and there concentrated in two very ill-defined longitudinal tracts with, in addition, a small dense spot on posterior margin very near sides (best seen without magnification). *Scutellum* punctate, microrugose, sometimes strongly raised, bare or squamose. *Mesosternal process* broad, apex truncate. *Elytra* globose (10 : 7·5–8·5), apex acuminate, shape similar in both sexes; humeral tubercle usually obsolete; post-humeral tubercle very large and broad-based as in *C. rugulosus* but with apex drawn out into an acute but blunt cone with axis deflexed ventrad; striae distinctly impressed on declivity only, strial punctures very small, sometimes obscured by scales; interstriae broad, flat, sometimes almost smooth but usually forming a series of low irregular transverse folds as in *C. rugulosus*; scales uniformly very dense throughout, whitish but brown scales predominate on declivity and form irregular patches on disc or are concentrated on interstriae 2, 4 and 6, forming dark stripes (rarely elytra brown throughout, except at sides). *Legs* as in *C. rugulosus* but hind femora less strongly tapering towards base (viewed from above)

and outer surface near base with large, sometimes confluent, punctures; corbels always with many adventitious setae; scales large, round and very dense throughout. *Underside* as in *C. rugulosus* but granules on ventrite 1 of male less well developed. *Aedeagus* (Text-fig. 25) very short, very strongly curved, depressed, terete, smooth; apex narrow, tip not deflexed. *Ovipositor* with valves strongly and closely compressed.

Holotype ♀. WESTERN AUSTRALIA: Esperance, 23.iv.1955 (*F. H. Uther Baker*), in the Western Australian Museum, Perth.

Paratypes. 8 ♂, 5 ♀, same data as holotype (10 FHUB, 2 BM(NH), 1 W); 3 ♂, 5 ♀, ditto but 22.iv.1955 (5 FHUB, 2 A, 1 BM(NH)); 2 ♂, 3 ♀, ditto but 25.iv.1955 (3 FHUB, 2 BM(NH)); 1 ♂, 1 ♀, Myrup, 26.iv.1955 (*F. H. Uther Baker*) (FHUB); 2 ♂, 1 ♀, Dalyup, 6.v.1960 (*F. H. Uther Baker*) (2 FHUB, 1 BM(NH)); 1 ♂, 1 ♀, Eradu, 21.x.1914 (*J. Clark*) (S). Total: 34 specimens.

Localities: Esperance; Myrup; Dalyup. The record for Eradu must be a mistake.

The name of this species was proposed by Marshall (i. litt.) as a well deserved tribute to Dr. Uther Baker. The general shape and especially that of the prothorax will distinguish this species from any other.

Catasarcus obesus sp. n.

(Text-figs. 2, 11, 26, Map 4)

Length 7·8–12·6 mm. Body black, legs and antennae very dark red. Scales white (with pink and green reflections) and olive-brown, dense throughout body and on legs. *Head* with frons flat or weakly convex; lateral frontal carinae straight (rarely weakly curved), usually sharp but not, or weakly, raised, weakly converging anteriorly; admedian carinae as long as laterals or nearly so (rarely only half as long), straight or weakly curved, parallel with adjacent lateral carinae or with each other and all four carinae usually equidistant from each other (Text-fig. 2); median frontal sulcus broad, deep and rather short; centre of frons without any median elevation, sides, including admedian carinae and lateral sulci, covered with dense round white scales which are continuous with imbricate ovate scales on vertex; latter usually olive-brown but often white in continuation of the frontal tracts; centre of frons with scattered or dense, mainly olive-brown scales; underside of head throughout with dense ovate scales, often becoming imbricate below (and behind) eyes. *Rostrum* × 1·2–1·4 (♂), × 1·1–1·2 (♀) as long as broad, distinctly widening apically; epistome well defined, disc flat or weakly concave, pitted, with two (apparently one) small flanking setae on each gena; median carina narrow, usually moderately and evenly raised but sometimes strongly raised and arched; dorsal surface densely squamose throughout, sides rounded basally, weakly converging apically; chin variable. *Antennae* with lengths of funicle segments 1–3 in ratio 1·9 : 1·5 : 1 (mean of nine), 4–6 slightly shorter than 3, subequal, 7 = 3 and *c.* × 1·7 as long as broad. *Prothorax* very strongly transverse (10 : 18·7–23·8), broadest near base, sides rounded, converging anteriorly; post-ocular lobes poorly to fairly well developed; upper surface smooth, very finely punctured (rarely with ill-defined granules at sides); transverse striae variable, posterior straight, often extending across full width (ill-defined in mid-line), anterior shorter, usually recurved posteriad towards sides; scales imbricate above coxae and along sides, often forming a stripe; elsewhere less dense or mainly olive-brown, sometimes forming two broad white longitudinal tracts on pronotum. *Scutellum* smooth, finely punctured, squamose. *Mesosternal process* very broad (as broad as base of middle femur) and usually abruptly truncate at apex. *Elytra* globose-acuminate (10 : 7–7·7), differing little between the sexes but inflated at base in some females; humeral tubercle small (rarely obsolete), usually cariniform with obtuse apex displaced posteriad; post-humeral area with a broad bulge, sometimes surmounted by a sharp tubercle; striae

distinctly impressed on declivity only, elsewhere surface thrown into a series of more or less continuous transverse folds; scales dense throughout, imbricate and exclusively white on sides around post-humeral tubercle, folds and interstriae bare (? abraded) or with olive-brown scales which form an irregular variegated pattern. *Legs* stout but femora scarcely swollen (Text-fig. 11); fore tibiae incurved towards apex and with rather large teeth; corbels narrow and usually with several adventitious setae; scales very dense throughout, round, white (often with greenish reflection) and olive-brown, uniformly mixed; setae slender, brown, inconspicuous. *Underside* very finely rugose; ventrites 1 and 2 with very small discrete granules; post-coxal cavities shallow or absent; densely and evenly squamose throughout, scales white but sometimes each ventrite with two olive-brown patches, near sides. *Aedeagus* (Text-fig. 26) strongly curved, smooth; apical half slender, depressed, weakly sulcate dorsally; apex narrow, tip somewhat swollen and not, or very weakly, deflexed. *Ovipositor* with valves strongly compressed.

Holotype ♂. WESTERN AUSTRALIA: Lake Varley, 20.ix.1954 (*F. H. Uther Baker*), in the Western Australian Museum, Perth.

Paratypes. 7 ♂, 2 ♀, same data as holotype (7 FHUB, 2 BM(NH)); 1 ♀, Ravensthorpe, 2.ix.1952; 1 ♀, Lake Carmody, 20.ix.1954; 1 ♂, same locality, 23.ix.1954 (all *F. H. Uther Baker*) (2 FHUB, 1 BM(NH)); 1 ♀, Dedari, i.1939 (*F. E. Wilson*) (FEW); 1 ♂, 4 ♀, Southern Cross, viii.1959 (*H. Demarz*) (4 Frey, 1 BM(NH)); 1 ♂, ditto but 5.ix.1962 (Frey); 10 ♂, 6 ♀, Widgiemooltha, 1.x.1962 (*A. M. Douglas* and *W. D. Findlay*) (12 W, 3 BM(NH), 1 V); 1 ♂, Kuminin [? = South Kumminin] (*E. F. du Boulay*) (S). Total: 37 specimens.

Localities: as listed above.

Host-plants: *Jacksonia* sp. (series from Widgiemooltha).

Catasarcus aspergetus sp. n.

(Text-fig. 32, Map 4)

♂. Length 12·3–13·7 mm. Body black, legs and antennae dark red. Scaling dense throughout, bluish white with black and golden-yellow patches. *Head* with frons flat or convex; lateral frontal carinae strongly raised, fairly sharp, straight or weakly curved, very weakly converging anteriorly; admedian carinae narrow, straight, parallel, as long as laterals or shorter; lateral sulci deep, filled with dense raised round or ovate yellow scales which extend (less densely) over admedian carinae and posteriorly to level of hind margins of eyes; scales behind eyes black, elsewhere on vertex and underside of head white, ovate and dense becoming imbricate below eyes. *Rostrum* × 1·1–1·2 (♂) as long as broad, widening rather abruptly towards apex; epistome flat, triangular, pitted; median carina broad, smooth, slightly or distinctly raised near base and projecting over transverse furrow; sides of dorsal area parallel, strongly raised, resulting lateral sulci filled with white or yellow scales. *Antennae* with lengths of funicle segments 1–3 in ratio 2 : 1·56 : 1 (mean of two), 4–6 subequal, 7 = 3 and × 1·4–1·6 as long as broad; club black, in strong contrast with whitish funicle. *Prothorax* transverse (10 : 17·7) broadest about middle and there angulate, sides posteriorly straight, subparallel or weakly converging, anteriorly weakly curved and distinctly converging; post-ocular lobes well developed and with (relatively) long vibrissae; pronotum uneven, finely punctured, obscurely granulate at sides; anterior transverse stria shallow or obsolete, posterior almost complete but ill-defined in mid-line; scales mainly white, very dense and imbricate at sides and above coxae; dorsal surface in anterior half with two admedian patches of dense yellow scales which also cover post-ocular lobes and surrounding area. *Scutellum* smooth, with fine punctures and scales. *Elytra* ovate-acuminate (10 : 7·2), strongly and evenly convex; humeral and post-humeral tubercles blunt

or obsolete; striae impressed only on declivity where punctures are very small; strial punctures elsewhere large; interstriae consequently narrow but not deformed; scales dense, whitish, yellow and black in patches, forming a complex pattern. *Legs* with femora squamose throughout, scales whitish, round, appressed, mostly contiguous on shaft, tessellate on knee, as also on tibia; tibial teeth small, sharp; corbels with several adventitious setae; setae on femora dark brown and conspicuous. *Underside* with dense round mostly imbricate whitish scales and long semi-recumbent pale setae which are rather conspicuous, especially on ventrite 5; post-coxal cavities small or obsolete, cluster of strongly raised granules behind them in paratype; holotype with anterior half of ventrites 1 and 2 and sides of 3–5 yellow and with some black scales among the white elsewhere. *Aedeagus* as in *C. obesus* but distinctly tectiform basally, not sulcate above and more strongly widening around phallotreme.

Holotype ♂. WESTERN AUSTRALIA: Wialki, ix.1959 (*F. H. Uther Baker*), in the Western Australian Museum, Perth.

Paratype ♂. Nulla Nulla, [19]33–352 (W).

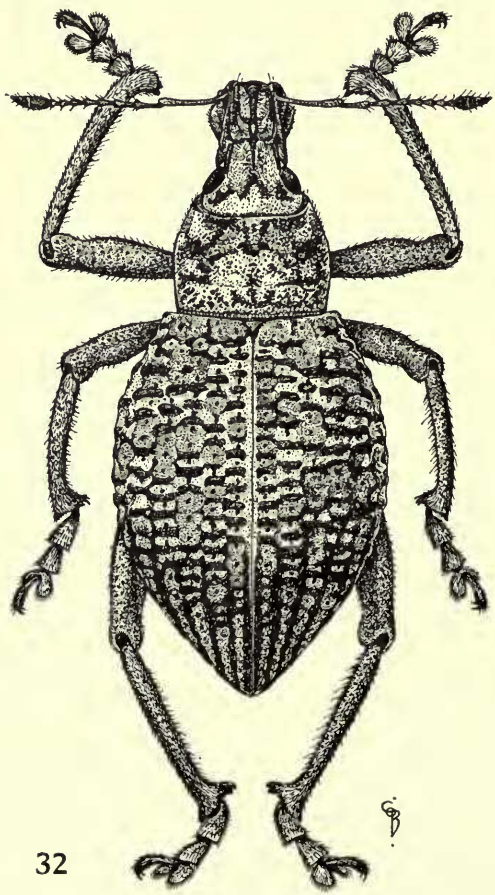


FIG. 32. *Catasarcus aspergetus* sp. n. ♂ (holotype).

Localities: as listed above. Of the several localities bearing the name Nulla Nulla, that nearest to the type-locality is assumed to be the one at which the paratype was taken.

It will be interesting to see, when further material is available, how the colour-pattern in this species varies. Even the present specimens differ; in the paratype, the interstriae and gaps between successive punctures are on the same level and both covered with black scales, producing a strongly marked reticulate pattern, while the punctures are filled with either white or yellow scales. The latter are in a minority and apart from a few on the disc, occur only at the base and in parts of striae 7 and 8. Where yellow punctures are adjacent, the intervening scales are also yellow (not black) so that continuous yellow areas are formed. This does not, however, disrupt the reticulate pattern very much. In the holotype, on the other hand, raised transverse folds are present on the disc and black scales occur only on them, so that the interstriae are obscured and the scales of both white and yellow punctures are contiguous laterally. The yellow punctures are also contiguous longitudinally, as in the paratype, but are here more numerous. The general appearance, on the disc, is that of a bluish white background with somewhat irregular black transverse lines, upon which has been superimposed a number of irregular deep yellow blotches. On the declivity, where the trans-strial folds are absent, the interstriae are raised and black while the striae are uniformly coloured, yellow dorsally and white at the sides. In this species, as in *C. azureipes*, the centres of the larger strial punctures are bare and pupil-like.

Catasarcus azureipes sp. n.

(Map 4)

Length 12·6–17·8 mm. Body black with white and blackish scales; femora red or dark red (knees black) with metallic blue or green scales; tibiae dark red, tarsi black; antennae dark red; setae brown throughout; red-brown powdery exudate often present. *Head* with frons flat or weakly convex, lateral frontal carinae raised, sharp, weakly curved, subparallel; admedian carinae usually as long as laterals (sometimes much shorter), straight, parallel or converging anteriorly, separated by a deep, sometimes wide, median furrow; centre of frons posteriorly usually with fine longitudinal striations, or rarely with a smooth median elevation; lateral sulci densely or sparsely filled with round or ovate white scales which sometimes extend sparsely over admedian carinae; vertex with dense ovate olive-brown and metallic blue-green scales; underside with a narrow tract of pure white scales below eye. *Rostrum* × 1·2 (♂), × 1·1 (♀) as long as broad, weakly widening apically; epistome large, triangular, weakly convex, finely pitted, clearly defined from median carina which is weakly raised, level, sometimes strongly depressed near junction with epistome; sides of dorsal area parallel, strongly raised, the resulting sulci filled with sparse or fairly dense ovate-elongate semi-erect white scales; oblique basal sulci usually well developed; apex in profile view rounded ventrally. *Antennae* with lengths of funicle segments 1–3 in ratio 2·2 : 1·42 : 1 (mean of four), 4–7 subequal, slightly shorter than 3, 7 broader than 6 and × 1·6 as long as broad. *Prothorax* transverse (10 : 16·7–18·6), broadest about middle, sides rather strongly rounded, distinctly constricted behind post-ocular lobes which are less well developed than in *C. obesus* but have longer vibrissae; dorsal surface evenly and finely rugose or obscurely granulate, more distinctly granulate at sides; anterior transverse stria obsolete, posterior stria represented by a deeply impressed line on either side; scales sparse, white and olive-brown (latter inconspicuous), white scales somewhat denser at sides and in anterior constriction; underside with irregular patch of very large round imbricate white scales

above coxa. *Scutellum* microrugose or smooth, punctate, usually with several elongate or filiform metallic blue or whitish scales. *Elytra* ovate-elongate (10 : 6·3–6·8), broadest about middle, somewhat flattened above, more steeply declivous posteriorly in female, apex more broadly rounded (in dorsal view) in male than in female; surface smooth and even throughout, devoid of granules and with only the finest puncturation and microsculpture; humeral tubercle obsolete in male, cariniform in female; post-humeral tubercle absent (sometimes represented by a low bulge); striae strongly impressed on declivity but very weakly on disc, especially in male; strial punctures small near suture, becoming larger towards sides, mostly isodiametric in male, strongly transverse in female; interstriae narrow, straight, sometimes partly sinuous; gaps between punctures convex, forming a reticulate pattern with interstriae in male, more strongly raised and linking together in female, producing a rectangular mesh pattern; all raised surfaces with very small olive-brown scales which are very dense on declivity and along suture; punctures filled with larger round white scales which form continuous tracts towards apex (at least at sides); centres of punctures bare, hence pupillate. *Mesepisternum*, mesepimeron and metepisternum with dense round white scales; mesosternum microreticulate and with feather-scales in punctures anteriorly; metasternum and rest of mesosternum, including inter-coxal process, with dense narrow whitish or somewhat hyaline scales. *Venter* with dense semi-erect elongate hyaline scales throughout; setae distinguished from these only by their greater length; ventrites 1 and 2 with large low granules, more evident at sides; post-coxal cavities large in male, small in female. *Legs* rather densely squamose; fore femora usually strongly swollen, as in *C. opimus*, with small round appressed vivid metallic blue or green scales; those on coxae and bases of femora larger, denser, ovate, whitish with strong green reflection (sometimes thus throughout); knees black with very dense, mostly blackish scales; tibiae with mixed blackish and green scales; tarsi with scales mostly or entirely blackish; setae on femora blackish, rather conspicuous; tibial teeth very small but hind tibia in male often with two to four larger teeth; corbels with one to several adventitious setae. *Aedeagus* similar to that of *C. obesus*; compressed in middle, and gradually widening around phallotreme; apex short, tip broadly rounded, swollen, not deflexed.

Holotype ♂. WESTERN AUSTRALIA: Lake Grace, [19]51–2105, in the Western Australian Museum, Perth.

Paratypes. 1 ♂, 2 ♀, same locality as holotype, 51–2103, 51–2104, 51–2224 (all W); 1 ♂, same locality, 51–2102 (BM(NH)); 1 ♀, Lake King, 31–843 (W); 1 ♂, ' W. Aust., L. E., 8.10 ' (V); 1 ♂, 2 ♀, Ongerup, 30.i.1961 (*F. H. Uther Baker*) (2 FHUB, 1 BM (NH)); 1 ♂, 1 ♀, Jarramongup [Jeramungup], 19.iv.1958 (*F. H. Uther Baker*) (FHUB). Total: 12 specimens.

Localities: as listed above.

In the specimens from Ongerup the scales on the venter are ovate-acuminate, whitish (tinted with brown exudate) and are thus quite distinct from the clothing setae. In one of the females from this locality most of the scales on the head and pronotum are of a strong metallic blue-green colour instead of white or bluish white.

An attractive and distinctive species. When totally abraded, however, it may be confused with *C. asphaltinus*.

Catasarcus varus sp. n.

(Text-figs. 10, 29, Map 4)

Length 8·8–12 mm. Body black with fairly dense golden or greenish white scales; legs red with pearly or whitish scales; setae brown throughout. *Head* with frons flat or weakly convex;

both pairs of frontal carinae rounded, weakly curved, weakly converging anteriorly and all equidistant from one another, admedian carinae as long as laterals or shorter (sometimes only half as long); shallow lateral sulci and admedian carinae covered with ovate golden scales; median frontal sulcus very wide and short; centre of frons smooth or with very feeble median elevation; underside throughout with fairly dense ovate or elongate pearly scales. *Rostrum* as long as broad in female, < × 1·1 as long in male, scarcely widening apically; epistome very large, well defined, flat or weakly convex, pitted and finely microreticulate with two (apparently one) flanking setae on each gena; median carina broad, smooth, level or weakly arched; dorsal area parallel-sided, lateral sulci rather deep, with ovate scales, typically golden basally, pearly apically; apex not at all expanded ventrally, mentum thus making an acute angle with epistome. *Antennae* with lengths of funicle segments 1–3 in ratio 2·35 : 1·5 : 1 (mean of three), 3–6 subequal, 7 × 1·7 as long as broad. *Prothorax* strongly transverse (10 : 19–20·7), broadest near base, sides weakly rounded, often parallel in basal half; post-ocular lobes fairly well developed; dorsal surface before anterior transverse stria smooth, shiny, with fine diffuse punctures, elsewhere obscurely rugose with some very ill-defined granules at sides; transverse striae well marked but irregular on disc; most of sides and underside with dense large ovate golden scales, upper side with sparse smaller ovate pearly scales throughout with, in addition, a small and fairly discrete pair of admedian patches of golden scales on anterior transverse stria and further golden scales along hind margin, usually forming a pair of very ill-defined patches directly in line with anterior ones. *Scutellum* smooth, finely punctured, with numerous elongate and filiform metallic scales. *Elytra* ovate (10 : 6·6–7·3), declivity almost vertical in female, evenly rounded in profile view in male; humeral tubercle of small or moderate size; post-humeral tubercle small or obsolete; striae impressed strongly on declivity, weakly elsewhere; interstriae convex, uniting across striae to form a regular hexagonal reticulum in male and a series of narrow transverse folds in female; scaling fairly dense, scales round, golden or greenish white, denser at base and in punctures; interstriae at sides with pearly or coppery scales, interspersed with smaller olive-brown scales especially on disc and declivity where latter may predominate. *Legs* red, unicolorous, or dark red with knees and tarsi almost black; hind femora distinctly curved in lateral as well as dorsal view (Text-fig. 10); tibial teeth very small in both sexes; corbels with few to many adventitious setae; femora with dense round pearly or whitish scales throughout; tibiae with very dense olive-brown scales dorsally, less dense and pearly ventrally; tarsi with dark scales; setae very dark throughout. *Venter* with post-coxal cavities linear in male, obsolete in female; ventrites 1 and 2 with scattered raised granules, strongly raised at sides in male; ventrites 3–5 with dense round golden scales at sides and elongate pearly scales elsewhere; ventrite 5 convex in both sexes. *Aedeagus* (Text-fig. 29) strongly tapering, tectiform and rugose dorsally in basal half; apical region slender, smooth, scarcely widening around phallotreme; tip elongate, not deflexed.

Holotype ♂. WESTERN AUSTRALIA: Esperance, 5.v.1960 (*F. H. Uther Baker*), in the Western Australian Museum, Perth.

Paratypes. 1 ♂, 1 ♀, same data as holotype but 23.iv.1955 (FHUB); 1 ♂, ditto but 22.iv.1955 (BM(NH)); 2 ♂, Esperance, Duke of Orleans Bay, 4.v.1960 (*F. H. Uther Baker*) (FHUB, BM(NH)); 2 ♂, Myrup, 26.iv.1955 (*F. H. Uther Baker*) (FHUB, BM(NH)); 1 ♀, ' W. Australia ' (V). Total: 9 specimens.

Localities: Esperance; Myrup.

In one of the specimens from Myrup all the scales are smaller and fewer in number than in the holotype, while in the other specimen from this locality most of the scales, especially on the elytra, are ovate instead of round.

Catasarcus ustulatus sp. n.

(Plate 1, Figs. 1, 2)

Length 10·5–11·2 mm. Entirely black. Scales dense, mainly golden brown; elytra with nine pale grey stripes, declivity unicolorous blackish brown. *Head* with frons distinctly convex; lateral frontal carinae fused indistinguishably with admedian carinae to form a pair of broad smoothly rounded prominences, separated by a short deep narrow cleft; eyes weakly convex. *Rostrum* × 1·2 as long as broad; posterior angles of dorsal area reduced to tubercles flanking the very broad strongly raised (and arched) median carina which projects posteriorly over the short transverse furrow; epistome small, strongly pitted, with greater part of disc sharply depressed, leaving broad carinae posteriorly; moderate chin present. *Antennae* with lengths of funicle segments 1–3 in ratio 2·4 : 1·96 : 1 (mean of two), all stout: 1 × 2·8, 2 × 2·5, 3 × 1·4 as long as broad and 7 as broad as long; club fusiform. *Prothorax* transverse (10 : 17·4–18·1), broadest about middle, sides subparallel in basal half, strongly rounded anteriorly; anterior constriction well marked, post-ocular lobes very large, rounded, vibrissae short, brownish, directed strongly dorso-mesad; transverse striae traceable but irregular; disc fairly even, with low rugae laterally and some granules at extreme sides; post-coxal callus with elliptical inter-coxal process. *Scutellum* relatively large, with dense or imbricate pale metallic scales. *Mesosternal process* strongly constricted in middle, hence spatulate. *Elytra* ovate-acuminate (10 : 6·8–7·4), declivity slightly steeper in female than male; humerus with low bulge in male, large rounded tubercle in female; post-humeral tubercle in both sexes large, strongly projecting, blunt and somewhat reflexed postero-ventrad; striae weakly impressed on disc and declivity (as in *C. hopei*); strial punctures small; interstriae 3, 5, 7 and middle part of 8 more strongly convex than others, especially in female; all interstriae on disc with a few irregularly disposed granuliform segments which occasionally unite to form a few short, very irregular transverse folds. *Legs* stout; fore femora scarcely swollen, weakly curved in vertical plane; middle and hind femora not swollen, broadest near apex; inner edge of all tibiae weakly bisinuate; teeth on fore and middle tibiae large, straight and narrow, largest just proximal of middle; teeth on hind tibiae much smaller and fairly uniform; corbels with few, if any, adventitious setae; scales very dense throughout, mainly pearly or golden on femora, mainly blackish brown on tibiae and tarsi; ventral extremity of each trochanter with a cone of imbricate brilliant whitish scales; setae very dark brown throughout, small but conspicuous on femora. *Venter* without any post-coxal depression in either sex; ventrites 1 and 2 with numerous small granules in male.

Vestiture of the three available specimens closely similar; scales of three main types: *golden* (mostly shortly ovate or round, sharpely acuminate, mainly semi-erect), *grey* (larger, quadrate, strongly ribbed, longitudinally convex, recumbent) and *dark brown* (as grey but smaller and usually more elongate). Head and rostrum with mainly golden scales but variable tract of dark brown scales along middle of head from transverse furrow to vertex; similar scales behind eyes and on part of median rostral carina; eyes narrowly encircled by brilliant pearly scales; underside of head with large pearly scales thinly sprinkled with brown; scales on genae and beside epistome pale grey; setae large, whitish. Antennae with scales uniform blackish brown but some grey on head of scape. Prothorax with mainly golden scales (paler and more brilliant at sides) but with median and adlateral dark brown stripes, former stopping short posteriorly before hind margin, latter anteriorly at anterior constriction; some pearly or grey scales intermixed with brown; further brown areas below sides and above coxae; setae brown throughout. Elytra with large pale blue-grey scales on the following interstriae: 1 and 3 over greater part of width in basal third to half; 5 similarly, from base to declivity; 7 at base (including entire humeral tubercle) and on most strongly convex part, just before declivity; this last, together with patches on 8 and 9, forms a prominent lateral flash which also covers greater part of post-humeral tubercle (in 10) and is usually narrowly connected to the humeral tract; irregular areas of blackish brown scales occur on more strongly convex interstriae and on declivity; remaining areas golden brown, scales becoming smaller and more erect towards apex, setae blackish brown throughout, very numerous on declivity.

Aedeagus terete but tectiform, smooth, tapering from base to apex without any expansion around phallotreme; apical region narrow, tip not deflexed.

Holotype ♀. WESTERN AUSTRALIA; '161 mile peg, Augusta Rd.', 19.iv.1957 (*J. A. L. W[atson]*) *via* L. M. Saunders, in the Western Australian Museum, Perth. (The collector's initials are inscribed beneath the data label.)

Paratypes. 1 ♂, 1 ♀, same data as holotype (W, BM(NH)).

The very precise type-locality is in the Yelverton area not far from Cape Naturaliste. Host-plants: *Leptospermum* sp. (type series).

Catasarcus rugulosus Boheman

(Text-fig. 27, Map 4)

Catasarcus rugulosus Boheman in Schönherr, 1845 : 380.
Catasarcus rugulosus Boheman; Pascoe, 1870 : 18.

Length 6·5–10·4 mm. Body black, legs and antennae dark red. Scales dense, mostly pearly or coppery, usually largely obscured or discoloured by golden brown powdery exudate. *Head* with frons weakly convex; lateral frontal carinae short, rounded and not, or very weakly, raised (rather strongly raised and sharp in some large females), straight or weakly curved, rather strongly converging anteriorly; admedian carinae variable, usually about as long as laterals, straight, parallel or weakly converging anteriorly; centre of frons even, or with a smooth elliptical or cariniform elevation; densely squamose throughout, including frontal carinae; lateral carinae with smaller scales; centre of frons with small appressed grey-brown scales; underside of head with dense oblong brilliant pearly scales, imbricate below eye (some also in front of eye); similar scales on vertex, but there often mixed with grey-brown scales especially in mid-line and behind eyes; eyes very weakly convex and × 1·7 as long as broad. *Rostrum* × 1·1–1·2 as long as broad, distinctly widening apically; epistome large, triangular, disc flat or depressed, finely pitted and microreticulate, with two (apparently one) flanking setae; median carina narrow, level, usually very weakly raised; dorsal area rectangular or with sides weakly converging basally, scales dense throughout but especially so at base; chin small and ill-defined. *Antennae* with lengths of funicle segments 1–3 in ratio 2·4 : 1·7 : 1 (mean of five), 3–7 subequal, 7 about × 1·3 as long as broad. *Prothorax* transverse (10 : 17·3–20), broadest between middle and base, sides more or less rounded and converging anteriorly; post-ocular lobes well developed; upper surface smooth or obscurely granulate with large and small punctures, usually with more distinct granules at sides; transverse striae variable, anterior strongly recurved posteriad, often obsolete or concealed by scales, posterior straight, incomplete in mid-line; scales dense below and at sides; upper surface with two broad pale ill-defined tracts which sometimes unite along hind margin but do not reach anterior margin; between these tracts a pair of round ill-defined pale spots on posterior transverse stria (best seen without magnification); rest of upper surface with much smaller and sparser pearly or grey-brown scales. *Scutellum* smooth, with numerous elongate scales. *Elytra* ovate-acuminate (10 : 7–7·6), narrower in male, inflated posteriorly in female; declivity oblique and apex weakly mucronate in both sexes; humeral tubercle obtuse, cariniform or obsolete; post-humeral tubercle moderate to very large, densely squamose, apex blunt or very blunt, base almost completely undefined, continuing in a straight line to shoulder (seen from above), similarly to costa ventrally and often continuous with convexity of elytra dorsally (seen from behind); striae weakly impressed on declivity, obscure or absent elsewhere; surface of disc thrown into a series of very low undulating transverse folds (sometimes obscured by scales); scales very dense throughout; sides, including post-humeral tubercles, with large round brilliant pearly scales; disc with coppery or deep golden scales which become progressively smaller darker and semi-erect on declivity where there are numerous small grey-brown squamiform setae; some-

times interstriae 3 and 5 with denser scales, forming pale stripes. *Legs* stout, femora weakly swollen with a dark spot at apex on inner and outer faces; fore and middle tibiae distinctly incurved towards apex, teeth large; hind tibiae straight, teeth usually subequal; corbels without, or with few adventitious setae; femora with round or ovate pearly scales on dorsal and ventral surfaces, setae broad and whitish (dark on knees); tibiae with scales round and dense or tessellate dorsally, ovate or elongate and sparse ventrally, setae dark. *Venter* with post-coxal cavities linear or absent; ventrites 1 and 2 with small scattered granules, denser, strongly raised and bead-like at sides of ventrite 1 in male; much less well developed or obsolete in female; scales dense and usually pearly throughout but sometimes golden on much of ventrite 2 and at sides of 3–5. *Aedeagus* (Text-fig. 27) tectiform in basal half, depressed apically; sides evenly tapering throughout; apex elongate, tip bluntly pointed, not deflexed. *Ovipositor* rather slender and about as broad as high; valves closely compressed.

Holotype ♂, with ' N. Holl./Hope ' in Schönherr's hand and ' Typus ' (printed) in Naturhistoriska Riksmuseum, Stockholm. Apparently unique. The Hope collection (Oxford) contains a female with ' rugulosus/Schonherr ' in what appears to be Hope's hand.

Over 60 specimens seen.

Localities: Albany (numerous records); Two People Bay; Waychinicup River; Cheyne Beach; Stirling Range (south); Borden. Apart from several old records for ' Swan River ', there is a false record for Melbourne in the Fry collection (*ex* Stevens) (BM(NH)).

Pascoe was unacquainted with this species when he made his revision but there is a specimen correctly named by him in the Fry collection (BM(NH)). This supports my view (p. 366) that he did not see Fry's material until his paper was in press; the only specimen of this species in his own collection is the paratype of *C. griseus*.

Catasarcus aerosus sp. n.

(Text-fig. 9, Map 4)

Length 8·7–13 mm. Body black, legs and antennae red (tarsi often black). Scales all or mostly coppery to pale pink. *Head* with frons convex; lateral frontal carinae strongly converging anteriorly, strongly curved to almost straight, usually bluntly rounded and not or weakly raised (rarely sharp and strongly raised); admedian carinae narrow, usually parallel or weakly converging; median frontal sulcus usually short; centre of frons smooth or with longitudinal striations or with a small smooth median elevation; lateral sulci and admedian carinae usually covered with large round semi-erect scales but these are sometimes replaced anteriorly by small elongate olive-brown scales which are also numerous in middle of frons and on lateral carinae; vertex and underside of head throughout with dense elongate appressed pearly scales (sometimes mostly olive-brown on vertex). *Rostrum* × 1·1–1·2 as long as broad, strongly widening at genae; epistome with disc flat or strongly depressed, coarsely pitted and microreticulate with a tuft of two to four flanking setae on either side; median carina rather narrow, strongly (rarely weakly) depressed in middle, raised at base (Text-fig. 9); dorsal area usually broader at apex than at base, sides straight or angled at junction with upper margin of scrobe; lateral sulci deep, filled with ovate scales and white setae, the latter predominating apically; chin distinct. *Antennae* with lengths of funicle segments 1–3 in ratio 2·2 : 1·6 : 1 (mean of five), 4–6 slightly shorter, subequal, 7 = 3, conical and × 1·3 as long as broad or less. *Prothorax* transverse (10 : 18·5–19·4), broadest in basal half; sides distinctly and evenly rounded; post-ocular lobes well developed; upper surface smooth or obscurely or irregularly granulate (more distinctly so at

sides); both transverse striae usually well marked, except in mid-line; scales large, round and very dense ventrally, especially above coxae and (usually) along sides, forming an ill-defined horizontal stripe; upper surface with smaller, uniformly dense scales of various shapes and sizes (sometimes all elongate olive-brown and inconspicuous) and prominent whitish setae. *Scutellum* micro-reticulate at base with a number of elongate and filiform scales. *Elytra* broadly ovate-acuminate (10 : 7·1–7·6) with shape as in *C. hopei* but differing less between the sexes; humeral tubercle obsolete or very obtuse, sometimes pre-basal, as in *C. obesus*; post-humeral tubercle small sharp and reflexed posteriad; striae and interstriae as in *C. bilineatus*; scales always very dense at base and on interstriae 9 and 10; elsewhere usually almost as dense and quite uniform but sometimes largely or almost entirely small, olive-brown and inconspicuous. *Legs* in fully mature specimens dark red with coxae, trochanters, knees, apices of tibiae and tarsi black; femora weakly swollen, as in *C. hopei*; teeth on fore tibiae fairly large, those on hind tibiae very unequal, two or three much larger than rest; corbels with few to numerous adventitious setae; tarsi much larger in male than in female; scaling variable, femora usually with fairly dense large round scales ventrally and very small narrow scales dorsally, with large elongate whitish setae throughout; tibiae very densely squamose, setae brown, at least apically; tarsi with whitish scales and dark brown setae. *Venter* with post-coxal cavities small or obsolete in male, usually absent in female; ventrites 1 and 2 with small raised granules (larger and denser at sides of ventrite 1) in male, smaller or obscure in female; with dense ovate scales and white setae throughout. *Aedeagus* similar to that of *C. obesus* but more slender; basal third strongly tapering, curved and evenly convex (not tectiform) dorsally; remainder straight, depressed, parallel-sided or weakly widening around phallotreme; apex short, tip rather broadly rounded, swollen, not deflexed. *Ovipositor* with valves strongly compressed, together much higher than broad.

Holotype ♂. WESTERN AUSTRALIA: Bolgart, 14.xii.1961 (*E. B. Britton* and *A. Douglas*), B.M. 1962–153, in the Western Australian Museum, Perth.

Paratypes. 32 ♂, 17 ♀, same data as holotype (40 BM(NH)), 3 W, 2 V, 2 Frey, 1 S, 1 A); 5 ♂, 6 ♀, Mogumber, 36–5410, –5411, –5412, –5414 and –5420 to –5426 (8 W, 3 BM(NH)); 1 ♂, Bejoording, i.1952 (*F. H. Uther Baker*); 1 ♀, Lancelin, 7.xii.1962 (*F. H. Uther Baker*) (both FHUB); 1 ♂, ' W. Australia ' (S). Total: 64 specimens.

Localities: as listed above. Lancelin is not the island of that name but a nearby mainland settlement.

In some females, interstriae 3, 5 and 7 are wider and more strongly convex than the others. In such cases partial abrasion produces a striped effect, as in many *C. griseus* but with the tones reversed. In addition to the characters given in the key, these species have utterly different aedeagi.

Catasarcus griseus Pascoe

(Text-fig. 28, Map 4)

Catasarcus griseus Pascoe, 1870 : 16, 22.
Catasarcus griseus Pascoe; Lea, 1918 : 266.

Length 8–11·9 mm. Body black, legs and antennae dark red. Scales dense, coppery to whitish. *Head* with frons weakly convex; lateral frontal carinae always well developed, extending posteriorly around top of eye and more or less sinuous (but not sharp); admedian carinae shorter than laterals (sometimes less than half as long), parallel or weakly converging anteriorly; median sulcus variable; centre of frons often with a smooth elongate elevation; lateral sulci rather deep, filled with dense semi-erect round or ovate scales which cover admedian

carinae; head behind eyes encircled by dense ovate-elongate closely appressed scales (sparser behind eyes and in mid-line ventrally). *Rostrum* × 1·1–1·2 as long as broad, strongly widening apically; epistome small, disc flat or depressed, coarsely pitted, microreticulate, with several separate flanking setae; median carina usually sharp near junction with epistome, becoming more rounded towards base, often weakly depressed in middle; dorsal area relatively narrow (exposing more of scrobes from above), somewhat lyre-shaped (as in *C. hopei*) or simply subrectangular; lateral sulci often deep, filled with ovate semi-erect scales which, apart from a few small ones, do not extend anteriorly beyond level of apex of epistome; apex strongly expanded laterally and ventrally, so chin well developed as in *C. bilineatus*. *Antennae* with lengths of funicle segments 1–3 in ratio 2·1 : 1·5 : 1 (mean of ten), 3–7 subequal, 7 about × 1·3 as long as broad. *Prothorax* strongly transverse (10 : 18·6–20·5), broadest at base (sometimes near middle); sides straight or weakly rounded in basal half, usually parallel in male, converging anteriorly in female; post-ocular lobes well developed, with relatively long whitish vibrissae; upper surface finely and diffusely punctured and with scattered larger punctures, obscurely granulate on disc, more distinctly so at sides; transverse striae variable, at least posterior well developed at sides; scales large, round or ovate, very dense below and at sides, dorsally forming two longitudinal tracts, often very ill-defined or reduced to a pair of ill-defined patches near anterior margin; rest of upper surface with smaller elongate olive-brown (or whitish) scales and conspicuous whitish setae. *Scutellum* smooth, punctate, with a number of filiform metallic scales. *Elytra* resembling those of *C. hopei* in shape and proportions (10 : 6·8–7·3); sides between humerus and post-humeral tubercle straight; humeral tubercle absent or obsolete; post-humeral tubercle large, broad-based, apex blunt or sharp, reflexed posteriad; striae impressed strongly on declivity, weakly elsewhere; interstriae broad, rather strongly convex especially on declivity, shiny but finely punctured, partly sinuous, partly uniting across the striae to form an irregular reticulum or short low transverse folds; suture sometimes depressed; scales of various sizes, fairly uniformly distributed when surface is even but confined to depressions when intervals, etc., are strongly raised; scales larger and imbricate on interstriae 9 and 10, sometimes dense along suture and alternate interstriae (especially 5), forming pale stripes; extensive area on declivity with very dense round brown scales on interstriae and small pale scales scattered irregularly along striae: setae brown throughout. *Legs* stout, dark red, often with darker knees; tibial teeth large, those on hind tibia very unequal; corbels broad, with from nought to many adventitious setae; tarsi much larger in male than in female; femora fairly densely squamose, scales smaller dorsally, larger ventrally and at apex; tibiae with very dense scales throughout, round along dorsal edge, ovate ventrally; setae whitish but often darker on knees and tibiae. *Venter* with post-coxal cavities variable; ventrites 1 and 2 finely to strongly granulate; densely and uniformly squamose. *Aedeagus* distinctive (Text-fig. 28), terete, smooth (apart from some obscure sculpture below phallotreme); base straight, apex curved (converse of three preceding species); compressed in middle and there higher than broad, highest near phallotreme; sides strongly widened around phallotreme; apex narrow, tip sharp, somewhat swollen, distinctly deflexed. *Ovipositor* as in *C. aerosus*.

Holotype ♂, with ' West/Australia ' and ' Catasarcus/griseus/*type* Pasc.' in BM (NH).

Paratype ♀, with ' Swan River ' (BM(NH)).

Localities: Forrestdale; Maida Vale; East Midland; Kenwick; Bullsbrook; Chittering; Gingin. A record for Geraldton from the J. Clark collection (BM(NH)) is highly dubious.

Host-plants: *Casuarina* sp. (Perth, Maida Vale, 31.viii.1946 (*R. P. McMillan*) (W)). *Leptospermum* sp. (same data as preceding but x.1939 (W)).

The paratype is a female of *C. rugulosus* but the holotype so closely resembles it that Pascoe may be excused for thinking they were conspecific. Lea compared the

paratype (sent to him as *C. griseus*) with a specimen of *C. hopei* and considered that they were probably varieties of one species. He based this conclusion on the similarity in the proportions of the first two funicle segments, failing to appreciate the striking differences in the frontal carinae, epistome, etc.

A variable species, easily confused with several others, especially *C. aerosus*. The form of the aedeagus is, however, unique.

Catasarcus latheticus sp. n.

(Map 3)

Length 9·4–10·3 mm. Body black, legs and antennae dark red. Scales coppery or golden where dense, whitish, bluish green or pearly elsewhere but mainly small and brown on declivity of elytra. *Head* with frons distinctly convex; lateral frontal carinae weakly raised, weakly curved, weakly converging anteriorly; admedian carinae short, close together, subparallel, separated by a very narrow median sulcus; sides of frons with dense loose ovate golden scales and erect white setae which extend well beyond level of hind margins of eyes and cover admedian carinae; middle of frons with rather sparse small dark brown scales and similar setae; scales on vertex dense, olive-brown, on underside of head dense, elongate, whitish and metallic. *Rostrum* as in *C. hopei* but genae wider and chin distinct; dorsal area broader, flatter and with well marked oblique basal sulci; tufts of setae flanking epistome with up to six setae per tuft and several much smaller setae on epistome itself at sides; vestiture of dorsal area as that of frons. *Antennae* with lengths of funicle segments 1–3 in ratio 2·4 : 1·4 : 1 (mean of three). *Prothorax* as in *C. hopei* but more distinctly granulate and admedian scale-patches larger, in one case extending as broad tracts to hind margin. *Scutellum* as in *C. hopei*. *Elytra* in both sexes shaped as in male of *C. hopei*, sculpture as in female of that species; entire upper surface (except declivity) with regular pattern of very low, irregular transverse folds; full width of interstria 1, from base at least to declivity with very dense golden or coppery scales and small white setae; similar, less well defined tracts (best seen without magnification) on posterior part of interstria 5 and middle of 6, also at sides from stria 8 to costal margin; elsewhere scales usually smaller and sparser (except in some larger punctures), with mainly brown setae; scales on declivity all small, mainly brown. *Legs* as in *C. hopei* but tarsi more slender, segment 3 in male scarcely larger than in female of *C. hopei*; corbels with eight to ten adventitious setae in male, three in female; scales bluish or greyish white, setae brown (inconspicuous on femora). *Venter* as in *C. hopei*. *Aedeagus* as in *C. bilineatus* but less elongate.

Holotype ♀. WESTERN AUSTRALIA: Moore River (*H. W. Brown*), in the South Australian Museum, Adelaide.

Paratypes. 1 ♂, 1 ♀, same data as holotype (S, BM(NH)).

Catasarcus bilineatus Fåhraeus

(Text-figs. 8, 33, 36, Map 3)

Catasarcus bilineatus Fåhraeus in Schönherr, 1840 : 813.
Catasarcus bilineatus Hope; Taschenberg, 1869 : 31.
Catasarcus suturalis Pascoe, 1870 : 15, 18, **syn. n.**
Catasarcus bilineatus Fåhraeus; Pascoe, 1870 : 15, 18.
Catasarcus bilineatus Fåhraeus; Heyne and Taschenberg, 1908 : 226; pl. 30, fig. 12.

Length 9–16 mm. Body black, legs and antennae dark red. Scales dense, metallic pink or coppery (rarely whitish); some yellow-brown powdery exudate often present. *Head* with frons flat or weakly convex; lateral frontal carinae variable, weakly to very strongly raised, straight or

weakly curved, parallel or weakly converging anteriorly; admedian carinae greatly reduced (as in *C. frontalis*) and completely covered with loose, dense or imbricate ovate scales which fill the broad shallow lateral sulci and extend posteriorly to level of hind margins of eyes or beyond, sometimes continuous with the dense elongate appressed whitish scales of vertex; median sulcus deep, usually almost as long as lateral carinae; frons between eyes seldom with any median elevation, sometimes with a few longitudinal striations; underside throughout with fairly dense ovate or elongate scales. *Rostrum* × 1·2–1·3 as long as broad, proportions similar in both sexes, gradually widening apically; epistome very ill-defined, strongly microreticulate, strongly punctured, with several small setae on disc; flanking setae large and numerous; median carina broad, smooth, raised and arched, highest at, or a little behind, middle (Text-fig. 8); dorsal area broad, weakly lyre-shaped, sides not, or weakly raised, except above antennal insertions, densely squamose throughout; chin very distinct (Text-fig. 8). *Antennae* with lengths of funicle segments 1–3 in ratio 2·4 : 1·4 : 1 (mean of six), 4–7 subequal, slightly shorter than 3, 7 < × 1·5 as long as broad (quadrate in some small females). *Prothorax* transverse (10 : 16·3–18), broadest about middle; sides usually rather strongly rounded but often subparallel in basal half; post-ocular lobes well developed; upper surface finely punctured, smooth and shiny or finely rugose or obscurely granulate; sides always with well defined granules; anterior transverse stria distinct but ill-defined; traces of posterior stria usually slight; post-coxal callus large; dorsal surface variably squamose, sometimes with dense ovate scales throughout (except on much of anterior border), sometimes such scales confined to sides and a large ill-defined patch on either side of disc, sometimes scales smaller, inconspicuous, mixed with small elongate olive-brown scales which are denser near front margin; scales on underside larger, ovate-truncate or oblong, imbricate throughout and extending over at least lower part of post-ocular lobes. *Scutellum* very small, smooth, finely punctured, with elongate and filiform scales. *Elytra* ovate (10 : 6·4–7·2), narrow in male, inflated and with apex weakly mucronate in female; humeral tubercle small or obsolete; post-humeral tubercle small, sharp and reflexed posteriad; striae distinctly, sometimes strongly, impressed throughout; strial punctures small; interstriae broad and strongly convex but also deeply segmented by transverse impressions opposite each strial puncture. These smooth granuliform segments may be isodiametric, transverse or double; in the last case, the two sub-granules lie obliquely to the long axis of the interstria. Usually the striae are more strongly impressed than the transverse impressions, so that the interstriae retain their integrity; in some females, however, the reverse is the case and the interstrial segments join up to form continuous undulating folds across the elytra. Interstria 1 in female broad, flat, finely rugose, sometimes depressed, with large, very dense or imbricate ovate-truncate scales throughout, forming a well marked stripe; scales of sutural stripe less dense in male, especially on declivity; similar dense scales on interstriae 9 and 10 and in strial punctures (coalescing along striae); elsewhere smaller, less dense, often olive-brown on declivity. *Legs* with fore femora scarcely larger than hind, unicolorous; tibial teeth very small, even in male; corbels with from very few to many adventitious setae; scales large and dense on dorsal and ventral surfaces of femora, very small or absent on sides, smaller and subtessellate on dorsal edge of tibiae towards apex, ventral edge largely bare. *Venter* densely squamose throughout; post-coxal cavities well developed in male, shallow or obsolete in female; ventrite 1 in male with numerous raised granules. *Aedeagus* (Text-fig. 36) gradually tapering from base to phallotreme, evenly curved, smooth, terete (margins of phallotreme sometimes shortly produced along dorsal surface); apex evenly tapering to a sharp point, tip extensively swollen, strongly deflexed. *Ovipositor* slender, about as broad as high towards apex; valves compressed.

Holotype of *bilineatus*, ♀, with ' *Polydius? bi/lineatus* Hope/Swan Rivier./N. Holl. Hope ' and ' Typus ', in Naturhistoriska Riksmuseum, Stockholm. Unique. There is also in the Schönherr collection a very small male, with ' Swan Riv./N. Holland./ Hope.' and ' Paratypus ' (the latter now inverted).

Holotype of *suturalis*, ♂, with ' Perth ' and ' Catasarcus/suturalis/*type* Pasc.' in BM(NH). Unique.

Over 220 specimens seen.

Localities: Perth and environs (numerous records); Wanneru; Bullsbrook; Hill River; Beverley; Jarrahdale; Pinjarra; Waroona; Yarloop; Bunbury; Busselton. A record for Kukerin (W) requires confirmation. A specimen labelled ' Manyanup ' may be from Mayanup. Three specimens with ' Kalgoorlie/W. A./C. Barrett ' in F. E. Wilson's hand (FEW) must be wrongly labelled. Specimens from the J. Clark collection labelled ' Geraldton ' (FEW, BM(NH)) are probably inaccurate if not actually false, as are old records for Albany (' K. G. S. ') and Adelaide in the Hope collection (Oxford).

Host-plants: *Casuarina* sp. (Perth, Maida Vale, 31.viii.1946 (*R. P. McMillan*) (W). One of these is mounted on a card with a specimen of *C. asphaltinus*; the other was originally mounted with two specimens of *C. griseus*). *Jacksonia* sp. (West Midland, 10.x.1953 (*A. Douglas*) (W)).

Pascoe distinguished *C. bilineatus* from *C. suturalis* mainly by the frons which ' rises towards the central groove on each side ' whereas in *C. suturalis* it is ' perfectly

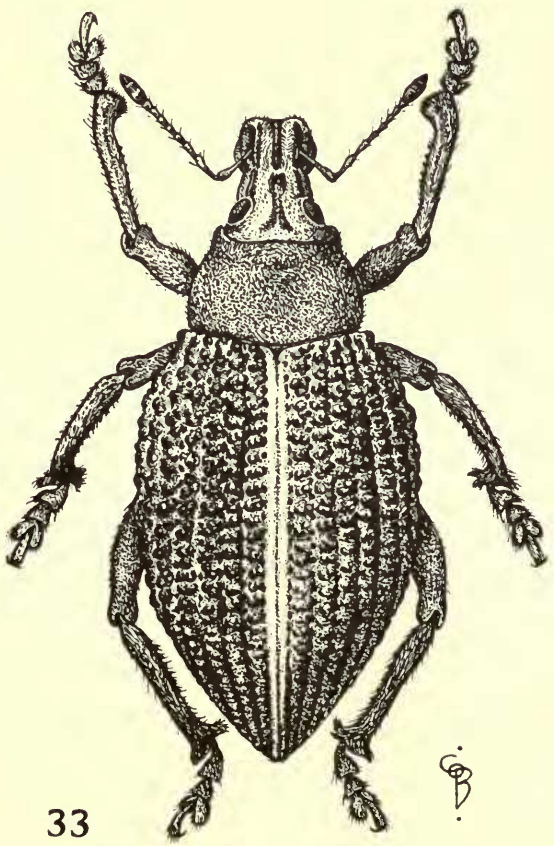


FIG. 33. *Catasarcus bilineatus* Fåhraeus ♀.

flat '. Although there are three typical specimens of *C. bilineatus* in his collection (one so determined by Pascoe himself), it seems that the foregoing distinction was based solely upon a highly aberrant female in which the admedian carinae are about as large as the laterals, giving the frons a distinctly convex appearance. The pronotum of this specimen is also unusual, being strongly and finely granulate throughout. The elytra, however, are normal.

The setose epistome and prominent sutural stripe make this one of the few readily recognizable species. In a very few specimens however, the sutural stripe appears to be totally absent. I have seen only one bleached specimen of this species.

Catasarcus sericeus Blackburn

(Text-fig. 34, Map 3)

Catasarcus sericeus Blackburn, 1894 : 270.
Catasarcus sericeus Blackburn; Lea, 1918 : 267.

♀. Length 10·8–11·8 mm. Body black, legs and antennae dark red. Scales fairly dense, very small, pearly, greenish or coppery. *Head* with frons very weakly convex, with fine diffuse punctures and scattered larger punctures; admedian frontal carinae very broad, very weakly convex, straight, weakly converging anteriorly, defined mesally only by the very narrow median sulcus which varies greatly in length; lateral carinae broadly raised, short, evenly and weakly curved, strongly converging anteriorly; lateral sulci very shallow, narrowly filled with recumbent whitish scales which continue posteriorly, becoming denser behind and below eyes; vertex itself with dense elongate olive-brown scales which also occur sparsely on admedian carinae; eyes small, nearly flat. *Rostrum* × 1·3 as long as broad, distinctly widening towards apex but chin weak; epistome triangular, densely pitted and finely microreticulate, disc usually abruptly depressed and with a few small setae at sides; median rostral carina broad, smooth, evenly raised, not, or very slightly arched; dorsal area weakly lyre-shaped, sides weakly raised, resulting sulci with numerous ovate semi-recumbent scales which may extend along sides of epistome. *Antennae* with lengths of funicle segments 1–3 in ratio 2·3 : 1·65 : 1 (mean of three), 4–7 subequal, scarcely longer than broad. *Prothorax* twice as broad as long, broadest near base; sides fairly strongly rounded, anterior constriction weak, post-ocular lobes fairly well developed; anterior transverse stria usually ill-defined, posterior represented by a short impressed line on either side; upper surface with anterior border smooth, diffusely punctured, remainder obscurely granulate and diffusely punctured with some well defined granules at sides; scales fairly dense but small, elongate, directed antero-mesad, whitish or olive-brown, denser along hind margin and in midline where they form a narrow stripe; underside and post-ocular lobes (in part) with dense larger ovate scales, similar to those around eyes. *Scutellum* with horizontal (apical) portion very small and smooth, remainder microrugose and with a few filiform scales. *Elytra* subglobose (10 : 7·3–7·8), inflated at base, slightly flattened above and at sides and with declivity almost vertical; humeral tubercle pre-basal, very small or obsolete; post-humeral tubercle small, obtuse (sometimes sharp); striae weakly impressed generally, often not at all on disc; strial punctures very small; interstriae broad, flat or weakly convex; narrow trans-strial folds often present on disc, producing a rectangular mesh pattern; scales greenish white or coppery, mostly very small, ovate, appressed, evenly distributed, seldom contiguous and rarely overlapping, except on interstriae 9 and 10 and sometimes in a few strial punctures; centres of punctures bare; interstriae on declivity with olive-brown scales along middle of each. *Legs* fairly densely squamose, femora with some large ovate scales dorsally and ventrally, small elongate ones elsewhere; setae long, pale and recumbent; tibial teeth small; corbels with few adventitious setae. *Venter* with post-coxal cavities shallow or obsolete; ventrites 1 and 2 with very small scattered granules; scales small and sparse apart from small ill-defined patch on either side of ventrites 3–5; setae long, pale and recumbent. *Ovipositor* as in *C. bilineatus*.

Holotype ♀, with ' 3495/W. A. [red] T. [black] ' and ' Catasarcus/sericeus, Blackb.' in BM(NH). Unique.

Five specimens seen, all female (3 S, 1 BM(NH), 1 FEW).

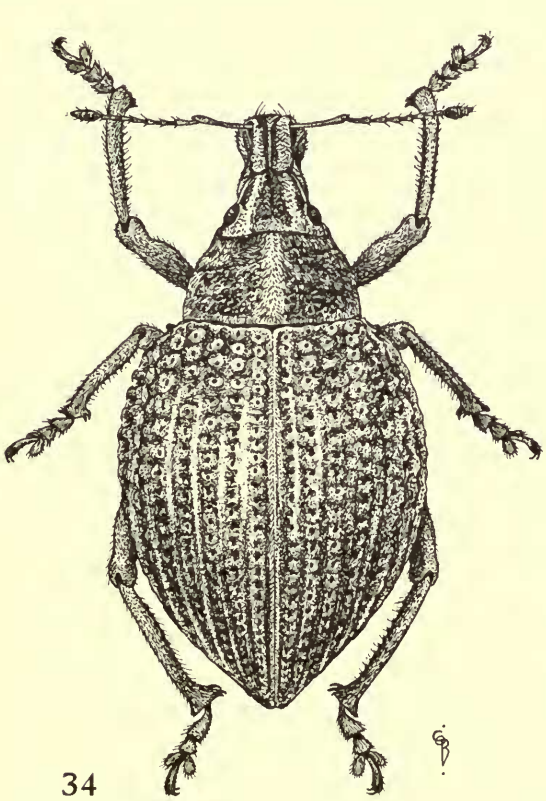
Localities: Tammin. Type-locality unknown.

I have been unable to recognize the specimen from Kuminin [? = South Kumminin] which Lea somewhat doubtfully referred to this species; it may be the specimen from this locality which I have included in the type-series of *C. obesus* but it bears no label by Lea and its colouring does not altogether agree with his description.

Catasarcus hopei Fåhraeus

(Text-figs. 3, 6, 35, 37, Map 3)

Catasarcus hopei Fåhraeus in Schönherr, 1840 : 815.
Catasarcus vinosus Pascoe, 1870 : 16, 21, **syn. n.**
Catasarcus effloratus Pascoe, 1870 : 16, 21, **syn. n.**
Catasarcus Hopii Fåhraeus; Pascoe, 1870 : 16, 22 [Incorrect subsequent spelling].
Catasarcus ovinus Pascoe, 1870 : 16, 26, **syn. n.**



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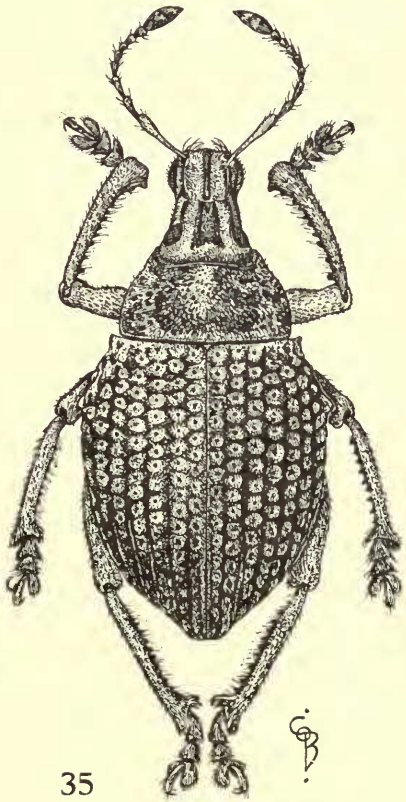

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FIGS. 34, 35. 34, *Catasarcus sericeus* Blackburn ♀. 35, *C. hopei* Fåhraeus ♂.

Catasarcus ovinus Pascoe; Lea, 1909*a* : 155.
Catasarcus ovinus Pascoe; Lea, 1918 : 265.

Length 7·5–14 mm. Body black, legs and antennae dark red. Scales small and dense, whitish, golden yellow, pearly, coppery, green or brown, often all occurring in same specimen with one colour (usually golden yellow or coppery) predominating; yellow-brown powdery exudate sometimes present. *Head* with frons distinctly convex; admedian frontal carinae (Text-fig. 3) very large, straight and parallel or very weakly converging anteriorly, separated by a narrow median sulcus which becomes broader and shallower posteriorly, sometimes with longitudinal striations but with no median elevation; lateral carinae distinct, often sharp, almost straight, parallel or weakly converging anteriorly; lateral sulci narrow, filled with pale scales which do not cover admedian carinae but extend posteriorly to join the dense appressed brown scales encircling back of head; centre of frons and admedian carinae with small brown squamiform setae; underside of head with dense ovate-elongate pale scales throughout, densest below eyes. *Rostrum* × 1·1–1·3 as long as broad, scarcely widening apically; chin weak; epistome elongate, flat or convex, pitted, microreticulate, scarcely defined from median carina which is broad, smooth, usually very strongly raised and arched, highest near base, so that in profile view its curvature is continuous with that of admedian frontal carinae (if these are low, it may exceed them in height) (Text-fig. 6); dorsal area lyre-shaped, sides somewhat raised forming shallow lateral sulci which are filled with scales. *Antennae* with lengths of funicle segments 1–3 in ratio 2·4 : 1·3 : 1 (mean of four), 4–7 subequal, 7 broadest, seldom longer than broad. *Prothorax* strongly transverse (10 : 17·8–20·5), broader in female than in male, usually broadest near base (sometimes near middle); sides rounded, often strongly so; post-ocular lobes fairly well developed, anterior constriction distinct; anterior transverse stria ill-defined, posterior represented by a short impressed line on either side (often obsolete); dorsal surface smooth or weakly granulate, with large and small punctures which vary from diffuse to rather dense; scales also diffuse to rather dense, either uniform or condensed into ill-defined patches, usually one pair above post-ocular constriction and another at base near sides; setae dark brown and inconspicuous. *Scutellum* smooth, usually with a few elongate or filiform metallic scales. *Elytra* with proportions 10 : 6·8–7·6; in male, globose-acuminate, basal two-thirds evenly rounded above and at sides, apical third with sides and declivity almost straight, apex acute; in female, more strongly inflated posteriorly, hence sides and dorsum somewhat flattened, declivity steeper, apex less acute; humeral tubercle small, sharp or blunt, sometimes obsolete; post-humeral tubercle small to moderate, usually sharp and strongly recurved posteriad; striae strongly impressed on declivity and at sides; strial punctures large on disc, diminishing rapidly towards declivity where they are completely obscured by scales. In most males and some females, the strial punctures on the disc are very large and alternate with those of adjacent striae; in these cases, the interstriae are narrow, sinuous and bare and together with the narrow raised gaps between successive punctures, form an hexagonal mesh pattern, exactly as in *C. longicornis*. In some females, however, the punctures are smaller and tend to lie opposite one another; the gaps tend to link up across the broad flat interstriae, forming narrow transverse folds; even where this does not occur, the pattern is that of a rectangular, rather than hexagonal mesh. In some specimens of this latter type, the scaling is denser on alternate interstriae, producing a striped effect; in other cases, the scales along the suture, though no denser than elsewhere, are strikingly lighter in colour. *Legs* densely squamose, scales ovate to elongate, white or greenish white, easily lost; tibiae with small to moderate, sharp, recurved teeth along ventral edges; corbels almost always without any adventitious setae. *Venter* with post-coxal cavities narrow, squamose, deep in male, shallow or obsolete in female; ventrites 1 and 2 with numerous very small granules, often concealed by scales; scales fairly dense, ovate to elongate, pale; setae broad, brown or hyaline. *Aedeagus* highly characteristic (Text-fig. 37), smooth, apical region weakly sulcate below. *Ovipositor* rather slender, valves compressed.

The male specimen described by Fåhraeus is no longer present in the Schönherr collection; this species is there represented by two female specimens. One is that

mentioned by Fåhraeus on p. 817 and bears Hope's name (quoted by Fåhraeus) for the female sex (it is virtually the allotype of *C. hopei*); the other is merely labelled ' N. Holl./Hope ' but bears a Stockholm Museum ' Typus ' label (now inverted). By analogy with the other holotypes described by Fåhraeus, the missing specimen would bear the name ' *Polydius? vicinus* Hope '. Among Hope's specimens (Oxford) is a female labelled ' latus/mihi ' in Hope's hand and a male with ' vicinus/Hope ' in a similar hand and on identical paper.

The four specimens mentioned above are certainly conspecific and this leaves little room for doubt as to the identity of the missing holotype Grave doubt does exist, however, regarding the type-locality. As specimens apparently of this species have recently been taken in the Perth area, it is not possible to regard the stated type-locality, Swan River, as necessarily false. On the other hand, the species has always been common at Albany, a fact to which several specimens in Hope's collection labelled ' K. G. S. ' (including the female mentioned above) bear witness. The probability is, then, that all Hope's specimens came from Albany, or nearby and it is at least possible that the two Oxford specimens mentioned above came from the same locality, perhaps even the same series, as the missing holotype. In view of the ease with which flightless Curculionidae subspeciate, I feel that the original concept of this species will best be maintained by designating the Oxford male as neotype, leaving the question of type-locality open, rather than by designating an arbitrarily chosen specimen from an arbitrary locality.

NEOTYPE ♂, with ' Hopei./Schh: Supl/SR. ' and ' vicinus/Hope ' (the latter possibly in Hope's hand) in the Hope Department of Zoology (Entomology), University of Oxford. This specimen is 8·7 mm. long; it is only slightly abraded and fits the description well, although the pronotal maculae are indistinct. It has no unusual features and is complete, except for the left hind tarsal claw-segment.

The following specimens are in BM(NH):

Holotype of *vinosus*, ♂, with ' Champion B. ' and ' Catasarcus vinosus/*type* Pasc.' Probably unique but a very similar specimen has been labelled as a cotype (by G. J. Arrow).

Holotype of *effloratus*, ♀, with ' Champion B.' and ' Catasarcus/effloratus/*type* Pasc.' Unique.

Holotype of *ovinus*, ♀, with ' Queensland ' and ' Catasarcus/ovinus/*type* Pasc.' Unique.

Over 120 specimens seen.

Localities: Albany; Torbay; Tennessee; William Bay; Windy Harbour; Mount Barker; Stirling Range (Bluff Knoll); Cranbrook; Tambellup; Borden; Boscabel; Lime Lake; Nannup; Busselton; Capel River; Bunbury; Buckingham. Also recently taken in the Perth district by Dr. Uther Baker (Mount Pleasant, 8.ix.1958) but must be uncommon there. Apart from this record, there is no reason to think that specimens in the J. Clark collection (and elsewhere) labelled ' Swan River '

actually came from Perth and records from further north—Champion Bay (Pascoe collection), Geraldton, Eradu (J. Clark collection)—are almost certainly false. There remains a very large, strongly inflated female from the J. Clark collection labelled ' Kellerberrin/W. Australia/W. Crawshaw ' but I think this is erroneous also. Patently false records have been seen for all the other states.

Host-plants: *Leptospermum* sp. (Lime Lake, 25.x.1952 (*H. F. Broadbent*) (BM (NH)).

In stating that the description is ' a little ambiguous; the rostrum is said to have three grooves at the base, and two at the apex ', Pascoe shows that he has missed the point. Fåhraeus correctly observed that the true fronto-rostral junction lies posterior to the transverse furrow, so that the latter is to be regarded as situated *on* the rostrum (' ante medium '), not at its base and ' costis sulcisque frontalibus ad incisuram continuatis ', i.e. the four frontal carinae may be regarded as extending on to the base of the rostrum, the remainder of which (beyond the transverse furrow) has three carinae.

In contrasting *C. vinosus* and *C. ovinus*, Pascoe was misled by the sexual dimorphism of this species and by the false locality of the latter specimen. The holotype of *C. effloratus* is a very large but weakly inflated female with very large elytral punctures; I have seen no other specimen like it. Pascoe's specimens determined as *C. hopei* are all much smaller than his three holotypes.

This species is notable for the great variation in its size, shape, vestiture and sculpture on the one hand, and for the very distinctive and constant shape of its aedeagus on the other.

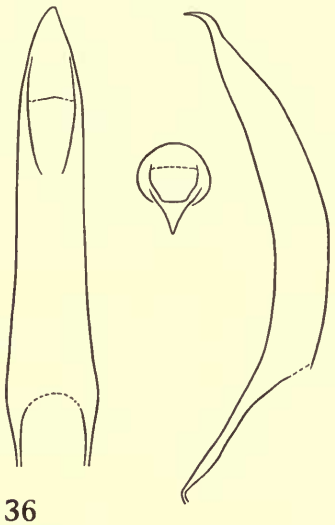
Catasarcus carinaticeps Lea

(Text-figs. 38, 39, Map 3)

Catasarcus carinaticeps Lea, 1909*a* : 158.

Length 10·9–15·8 mm. Body black, antennae and legs dark red but coxae, trochanters, tarsi and sometimes knees, black. Scales fairly dense, golden and whitish; golden powdery exudate present. *Head* with frons weakly (rarely strongly) convex; lateral frontal carinae sharp, straight or weakly sinuous, parallel or weakly converging anteriorly; admedian carinae straight, narrow, usually parallel, close together, about as long as laterals; median frontal sulcus usually very narrow but if not, then may contain one or two small accessory carinulae posteriorly; lateral sulci wide and usually deep, completely filled with loose imbricate deep orange or golden scales which sometimes cover distal ends of admedian carinae and extend posteriorly to, or just beyond, level of hind margins of eyes; underside of head with dense oblong-elongate pearly scales. *Rostrum* × 1–1·2 as long as broad, gradually widening apically, chin weak; epistome broad, weakly convex, finely pitted, clearly defined or not from median carina which is smooth and shiny, often broad and weakly arched; the broad lateral sulci filled with dense, usually whitish scales which contrast sharply with those on frons; surface of each gena with several large punctures or irregular longitudinal sulci. *Antennae* with lengths of funicle segments 1–3 in ratio 2·1 : 1·4 : 1 (mean of five), 3 and 7 subequal, 4–6 shorter, subequal; shortest segment (usually 6) not more than × 1·5 as long as broad. *Prothorax* strongly transverse (10 : 17·6–20), more strongly so in female than in male, broadest in basal half, distinctly rounded anteriorly; anterior constriction weak, post-ocular lobes well developed; dorsal anterior border smooth or with microsculpture, irregularly and rather coarsely punctured; remainder of dorsal surface with numerous small confluent granules and diffuse punctures, more strongly and regularly granulate at sides; small elongate blue scales occur sparsely throughout (in fresh specimens) and large broad

golden scales form irregular but symmetrical patches at sides and (usually) a pair of small admedian patches above anterior constriction; transverse striae weak. *Scutellum* smooth or microrugose, punctured and with elongate blue scales which may cover it completely. *Elytra* ovate (10 : 6·3–7·4), inflated and steeply declivous posteriorly in female, evenly rounded in profile view in male; humeral tubercle distinct and sharp in both sexes, basal, directed obliquely anteriad; smaller tubercles at bases of interstriae 5 and 3, all usually bare and shiny, hence



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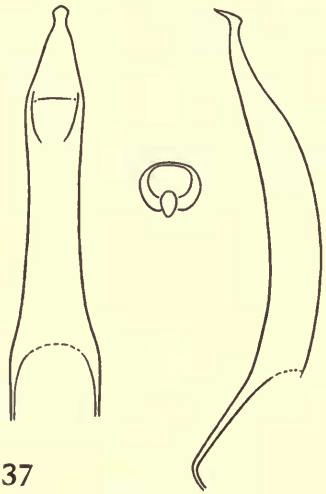

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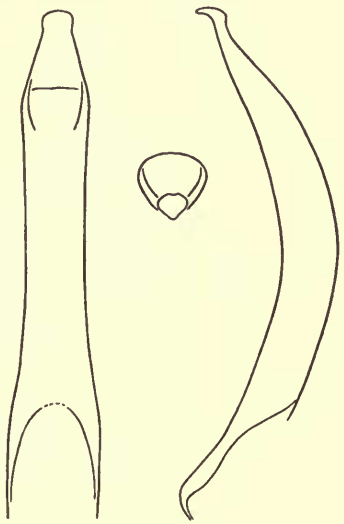

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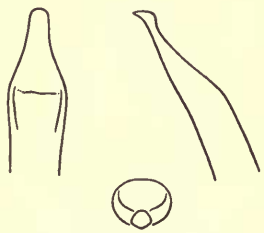

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FIGS. 36–39. *Catasarcus* spp. Aedeagus in dorsal, posterior and lateral view. 36, *C. bilineatus* Fåhraeus. 37, *C. hopei* Fåhraeus. 38, *C. carinaticeps* Lea (Esperance). 39, *Idem* (Mount Barren).

conspicuous; post-humeral tubercle very small, sometimes obsolete; raised granules usually present in shoulder region (rarely scattered throughout); striae strongly impressed at base and apex only; strial punctures usually wider than interstriae but not deforming them; base and usually shoulder region with very dense suberect golden scales; similar scales fill strial punctures (sometimes about half the punctures are filled with whitish scales, producing an irregular pattern somewhat as in *C. aspergetus*); interstriae flat and smooth with fairly dense appressed whitish or dark brown scales (which are easily lost). *Legs* fairly densely squamose, femora with dense large ovate-truncate or elongate whitish scales dorsally and in depression below knee ventrally, elsewhere with small elongate blue or green scales; setae short, pale; hind tibia with ventral edge weakly to strongly sinuous in both sexes, male with rather large teeth and stout setae; corbels without, or with only one or two adventitious setae. *Venter* with post-coxal cavities deep in male, shallow or obsolete in female and often filled with scales; ventrites 1 and 2 in male with large raised granules at sides, otherwise smooth or with small scattered transversely elongate granules; ventrite 5 strongly microreticulate (1–4 microrugose); fairly densely squamose except disc of ventrite 1 and exposed hind borders of 2–4. *Aedeagus* characteristic (Text-figs. 38, 39), subcylindrical, terete, evenly curved; tip broad, swollen, strongly and rather abruptly deflexed (larger and less abruptly deflexed than in *C. hopei*). *Ovipositor* as in *C. hopei*.

Holotype ♂, with 'carinaticeps/Lea TYPE/Esperance Bay' [*W. W. Froggatt* and *C. French*], in the South Australian Museum, Adelaide.

Paratypes. 1 ♂, same data as holotype (S); 1 ex., ditto (Macleay). I have either not seen, or failed to recognize, the two specimens from Swan River to which Lea refers; it is possible that they belong to another species.

Some 37 specimens seen.

Localities: Esperance; Gibson; Salmon Gums; Widgiemooltha; Ravensthorpe; Hopetoun; Mount Barren (east). A record for Northam (S) is certainly false.

Variation in this species is to some extent regional. Specimens from Esperance area have longer admedian frontal carinae with deeper lateral sulci and their femora are unicolorous; those from the western part of the range have shorter, broader admedian carinae and black knees. The single specimen from Widgiemooltha combines well developed carinae with black knees.

Catasarcus frontalis sp. n.

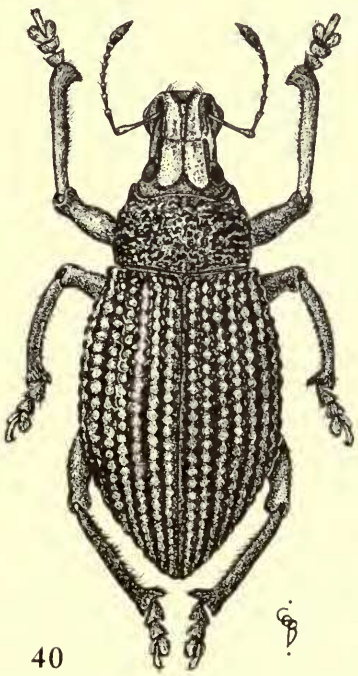
(Text-fig. 40, Map 3)

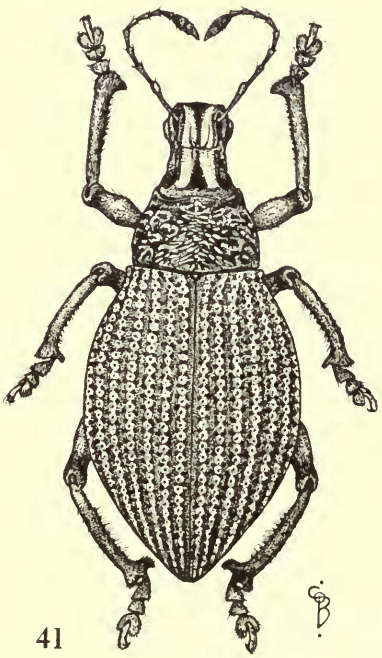
Length 10·6–15·3 mm. Body black, antennae and legs dark red (tarsi black). Scales fairly dense, whitish, yellow or (rarely) pink. *Head* with frons flat; lateral frontal carinae distinctly to strongly raised, sharp, varying from almost straight to distinctly sinuous; admedian frontal carinae greatly reduced, as in *C. bilineatus* and completely covered with loose imbricate semi-erect scales which completely fill the very broad flat lateral sulci and extend posteriorly to distinctly beyond level of hind margins of eyes; median sulcus very short; centre of frons, between lateral sulci, raised as a narrow bare flat striate wedge-shaped median carina with its apex projecting into the median sulcus (rarely absent); underside of head with dense elongate pearly scales throughout. *Rostrum* × 1·1–1·2 (♂), × 1–1·1 (♀) as long as broad, gradually widening apically; epistome flat, clearly defined or not from variable median carina; dorsal area densely squamose throughout, as frons. *Antennae* with lengths of funicle segments 1–3 in ratio 2·1 : 1·4 : 1 (mean of five), 7 longer than 6. *Prothorax* somewhat as in *C. asphaltinus* but more strongly transverse (10 : 18–20·4) and usually much more coarsely and irregularly granulate

above; scales dense below and between granules dorsally; impressed median line often present, also indicated by scales. *Scutellum* smooth or with punctures and with several oblong-elongate whitish scales. *Elytra* ovate (10 : 6·6–7·3), male evenly rounded dorsally in profile view, female somewhat inflated posteriorly, hence more distinctly declivous in apical third; humeral tubercle usually distinct and sharp (sometimes obsolete); post-humeral tubercle very small, often obsolete; other raised granules often present in shoulder region, sometimes sparsely throughout; a few small smooth shallow sharply defined depressions (' negative granules ') often present; striae rather strongly impressed throughout; strial punctures large and filled with scales, which are usually confluent along each stria; interstriae shiny, irregularly and tightly zigzag as in *C. asphaltinus* but with more granules and no wrinkles. *Legs* as in *C. asphaltinus* but femora less swollen and with fairly dense elongate and ovate-truncate whitish scales (easily lost, however); setae small, recumbent, pale or dark; tibiae densely squamose; corbels without, or with very few adventitious setae. *Venter* densely squamose, finely rugose; ventrite 5 strongly microreticulate; ventrites 1 and 2 with discrete bead-like granules, larger and confluent at sides of ventrite 1 in male; post-coxal cavities deep in male, shallow in female. *Aedeagus* stouter and less strongly curved than in *C. carinaticeps*; apex short, evenly tapering, tip less strongly deflexed.

Holotype ♂. WESTERN AUSTRALIA: Toodyay [1952?] (*H. F. Broadbent*), B.M. 1953–106, in the Western Australian Museum, Perth.

Paratypes. 2 ♂, 1 ♀, same data as holotype; 2 ♂, 1 ♀, Kellerberrin (*W. Crawshaw*); 2 ♂, same locality, 3.ii.1907 (*H. M. Giles*); 1 ♀, ditto but 6.ii.1907 (all BM(NH)); 3 ♀ same locality; 1 ♀, ditto (*French*) (all S); 1 ♂, 2 ♀, Tammin, 11.xii.1935 (*R. E.*





FIGS. 40, 41. 40, *Catasarcus frontalis* sp. n. ♂. 41, *C. opimus* Pascoe ♂

Turner) (BM(NH)); 1 ♂, 4 ♀, same locality, i.1939 (*F. E. Wilson*) (FEW); 1 ♀, Beverley (*A. M. Lea*) (Macleay); 1 ♂, same locality (*F. H. du Boulay*); 1 ♀, ditto (but *E. F. du Boulay*) (both S); 2 ♀, Spencers Brook, iii.1947 (*R. P. McMillan*); 1 ♂, ditto but 12.iv.1947; 1 ♀, Bejoording, 50–5154 (all W); 1 ♀, same locality, 26.xii.1950 (*R. P. McMillan*) (V); 1 ♂, Cunderdin, 8.i.1955 (*L. Jeanes*) (UW); 1 ♂, same locality, 7843 (BM(NH)); 1 ♀, Merredin (*L. J. Newman*) (BM(NH)); 1 ♂, ' Perth W. A. '; 1 ♂, ' W. A. du B. ' and ' K 36538 '; 1 ♂, ' W. Austr. ' and ' K 36538 ' (all A); 1 ♂, ' Swan R.' (*L. J. Newman*) (BM(NH)); 2 ♀, ' W. Australia ' (Macleay, S.); 1 ♀, ' W. A. 3686 ' (in red) (S); 1 ♂, without data (V); 1 ♀, Rivertree, N.S.W., ii.1935 (*E. Sutton*) (Gowing-Scopes). Total: 42 specimens.

Localities: Bejoording; Toodyay; Spencers Brook; Beverley; Cunderdin; Tammin; Kellerberrin; Merredin. The record for New South Wales is obviously false and that for Perth is probably inaccurate.

Host-plants: *Jacksonia* sp. (Spencers Brook, 12.iv.1947 (*R. P. McMillan*) (W)).

The head and rostrum of this species are closely similar to those of *C. opimus* but ventrite 5 has no transverse carina and the knees are never entirely black. The name was proposed by Marshall (i. litt.).

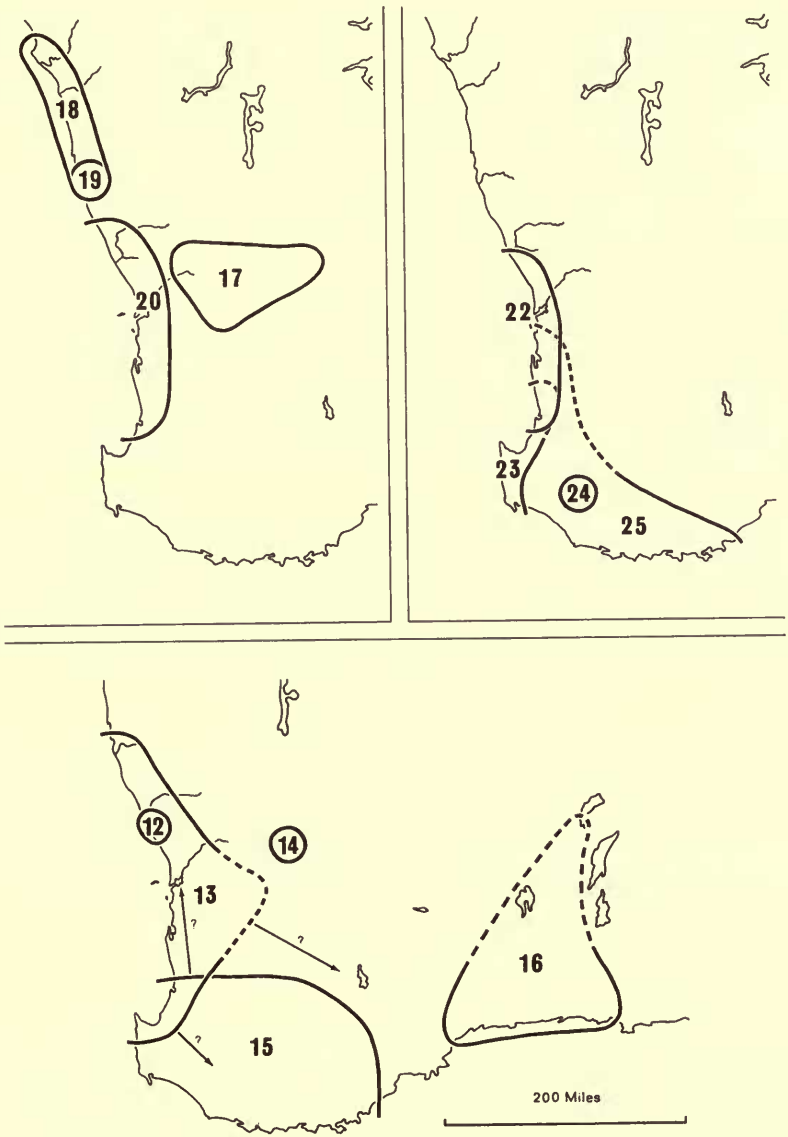
Catasarcus opimus Pascoe

(Text-figs. 5, 41, Map 3)

Catasarcus opimus Pascoe, 1870 : 15, 19.
Catasarcus ceratus Pascoe, 1870 : 16, 24, **syn. n.**
Catasarcus ceratus Pascoe; Lea, 1909*a* : 156.
Catasarcus granulatus Lea, 1909*a* : 156, **syn. n.**
Catasarcus ceratus Pascoe; Lea, 1918 : 266.
Catasarcus granulatus Lea; Lea, 1918 : 266 [= *ceratus*].

Length 10·2–19·5 mm. Body black, antennae and legs dark red (knees and tarsi black). Scales greenish, whitish or coppery; powdery exudate sometimes present. *Head* and *rostrum* (Text-fig. 5) as in *C. frontalis* but median frontal carina usually more strongly raised and epistome usually convex, merging gradually into the median rostral carina which is sometimes strongly raised. *Antennae* with lengths of funicle segments 1–3 in ratio 2 : 1·36 : 1 (mean of five), 4–7 subequal, shorter than 3. *Prothorax* as in *C. asphaltinus* but broader on average (10 : 17·3–20·7), usually more strongly rugose dorsally and with a larger prosternal callus. *Elytra* of similar proportions in the two sexes (10 : 6·1–7·1) but differing markedly in shape: male with sides strongly and evenly rounded, dorsal surface evenly but less strongly rounded in profile view (appearing somewhat flattened), apex rounded; female subcylindrical, distinctly contracted in apical third, apex acuminate; humeral tubercle small and sharp or obsolete; post-humeral tubercle usually absent; striae usually weakly impressed throughout; strial punctures usually small, often irregular in size, shallow and ill-defined; interstriae flat (or even narrowly sulcate), finely, densely and irregularly granulate throughout; sometimes gaps between strial punctures are raised forming transverse wrinkles which may (if the punctures are large enough) produce an irregular reticulate pattern, the granulation being then suppressed; vestiture more uniform than in *C. asphaltinus* but still dense in strial punctures and (in some females) along middle of each interstria; scales on interstriae flat, appressed, round or ovate-truncate; scales in punctures loose, elongate, thin, curling up at edges, often radiating from point on anterior side of puncture, producing a characteristic fan-like pattern in each puncture. *Legs* as in *C. asphaltinus* but

fore femora even more strongly swollen and knees always entirely black; setae very small, pale or dark, inconspicuous; corbel tapering to a point dorsally. *Venter* as in *C. asphaltinus* but ventrites 1 and 2 more strongly granulate; post-coxal cavities deeper in female, narrower in male and with posterior margin drawn up into a large warty prominence; ventrite 5 with a broad transverse fold, prominent in male, reduced (but seldom absent) in female. *Aedeagus* as in *C. asphaltinus*.



MAP 3. *Catasarcus* spp. Ranges. 13, *bilineatus*; 14, *sericeus*; 15, *hopei*; 16, *carinaticeps*; 17, *frontalis*; 18, *opimus*; 19, *pallidiventris*; 20, *asphaltinus*; 22, *cygnensis*; 23, *coruscus*; 24, *laevior*; 25, *impressipennis*.

Holotype of *opimus*, ♂, with ' West/Australia ' and ' Catasarcus/opimus/*type* Pasc.' in BM(NH). Two further specimens (1 ♂, 1 ♀) have been labelled as paratypes (BM(NH)).

Holotype of *ceratus*, ♂, with ' West Austral ' and ' Catasarcus/ceratus/*type* Pasc.' in BM(NH). Unique.

Holotype of *granulatus*, ♂, with ' granulatus/Lea TYPE/Geraldton ' in the South Australian Museum, Adelaide.

Paratypes. 1 ♂, with ' granulatus/Geraldton ' and ' Co-type ' (S); 1 ex. (♀?) with ' Geraldton/W. Australia ' and ' Co-type ' (Macleay).

More than 50 specimens seen.

Localities: Hill River; Geraldton. Type-locality unknown. In spite of several early records for Swan River, I doubt whether this species has ever occurred in the Perth area. Most of the early specimens were collected by F. H. du Boulay who was living near Geraldton at the time (Musgrave 1932 : 72). There is a specimen at Oxford bearing a printed label: ' Fremantle/W. A., J. J. Walker./July, 1901.' but the same label occurs on a series of *C. asphaltinus* in the same Museum, which inclines me to think that the former specimen may have been wrongly labelled. I have also seen a (presumably false) record for Beverley. A specimen labelled: ' Queensland/Challenger Exp./[18]85–44 ' (BM(NH)) is obviously wrongly labelled, as is one with ' Brisbane ' (Dresden).

The scales on the holotype are distinctly golden green, rather than ' golden yellow '; in some other early specimens they are pale grey. The holotype of *C. ceratus* is a bleached specimen (see p. 364). I have confirmed Gahan's report to Lea (Lea, 1909*a* : 156) that Pascoe erred in stating of the funicle ' the second [segment is] as long as the first '; it is in fact × 0·78 as long. The specimen seen by Lea (1918 : 266) is also bleached and bears his label: ' Glairy specimen. Have renamed it *granulatus*. Alas! '

After an interval of over half a century, this species was rediscovered by Dr. Uther Baker in 1962 in the Hill River district. These recent specimens differ from the earlier ones in having pink or coppery scales; the scales in the elytral punctures are less elongate and not obviously curled or in a fan-shaped arrangement in each puncture; the elytral granules are largely suppressed and the prosternal callus is not raised.

Catasarcus pallidiventris sp. n.

(Map 3)

Length 13–17 mm. Body black, legs and antennae dark red (tarsi black). Scales mostly pearly, strongly tinged with yellow powdery exudate. *Head* as in *C. carinaticeps* but admedian frontal carinae broader and more strongly raised; scale-tracts in lateral sulci narrower (about as in *C. asphaltinus*) and longer, extending distinctly beyond level of hind margins of eyes; underside rather densely squamose, scales below eye oblong, pearly or iridescent. *Rostrum* as in *C. opimus*, × 1·2 (♂), × 1·17 (♀) as long as broad; scales of same type and colour as on frons. *Antennae* with lengths of funicle segments 1–3 in ratio 2·1 : 1·5 : 1 (mean of eight); scales dense throughout, mostly pale grey-brown on shaft of scape, tending to become pale blue elsewhere or

at least on head of scape. *Prothorax* of closely similar proportions in both sexes: ♂, 10 : 16·4–17·6 (mean of five, 17·2); ♀, 10 : 16·6–18·3 (mean of seven, 17·6); sculpture as in *C. opimus* but fine median impressed line present; interstices and other depressions fairly well filled with scales of various sizes. *Scutellum* smooth, bare or with a number of filiform metallic green scales. *Elytra* slightly broader on average than in *C. asphaltinus* (10 : 6·4–6·9) but similarly dimorphic; sculpture variable, intermediate between that of *C. asphaltinus* and *C. opimus*; strial punctures in female of various sizes, disposed in an irregular sequence along each stria, all (except those in stria 7) well filled with scales; interspaces (especially around stria 7) with small ovate greenish scales. *Legs* as in *C. asphaltinus* but setae on femora smaller and knees sometimes darkened (but not black). *Venter* with very large shiny granules on ventrite 1 in male (larger and better defined than in *C. opimus*); ventrite 2 in male and both 1 and 2 in female with smaller granules; post-coxal cavities very large in male but posterior margin not drawn up into a tubercle (cf. *C. opimus*), female with deep post-coxal grooves; scales on ventrites 1 and 2 generally small, narrow, non-imbricate, absent from the large granules on ventrite 1; ventrites 3–5 with imbricate, ovate or somewhat elongate scales almost throughout (stopping short of edges); scales on ventrite 5 disturbed by irregular clusters of white setae; this sclerite sometimes has trace of transverse carina as is normally present in *C. opimus*. *Aedeagus* as in *C. asphaltinus*.

Holotype ♀. WESTERN AUSTRALIA: Hill River, 8.xii.1962 (*F. H. Uther Baker*) in the Western Australian Museum, Perth.

Paratypes. 6 ♂, 8 ♀, same data as holotype (9 FHUB, 2 W, 2 BM(NH), 1 V); 1 ♀, Moore River, 7.xii.1962 (*F. H. Uther Baker*) (FHUB); 1 ♂, with ' W. Australia ' and ' [18]68/20 ' on a blue disc (BM(NH): ' Purchased of Mr. Du Boulay (7/3/68) ').

Total: 17 specimens.

Localities: Hill River. The specimen from Moore River is thought to be wrongly labelled; a series of *C. asphaltinus* with the same data bear a strong superficial resemblance to the specimens of *C. pallidiventris* which were taken on the following day.

Catasarcus asphaltinus sp. n.

(Text-figs. 7, 42, 44, Map 3)

Catasarcus rufipes Fåhraeus; Pascoe, 1870 : 16, 22.
Catasarcus rufipes Fåhraeus; Lea, 1909*b* : 216.

Length 11–19·5 mm. Body black, antennae and legs dark red (tarsi black). Scales usually sparse, whitish or coppery, mainly in depressions, easily lost; golden yellow powdery exudate sometimes present. *Head* with frons flat, square; lateral frontal carinae strongly raised, sharp and sinuous, curving mesad anteriorly, laterad over eye posteriorly, evanescing where longest diameter of eye cuts dorsal margin; admedian carinae shorter than laterals, rounded, straight and parallel, closer to each other than to laterals but separated by a deep median sulcus; centre of frons with fine longitudinal striations but rarely with any wedge-shaped or cariniform elevation; eyes oblong, almost flat, × 1·9 as long as broad, rounded above, weakly acuminate below; lateral frontal sulci filled with large loose oblong scales and small whitish setae which extend posteriorly to just beyond level of hind margins of eyes and more or less cover anterior ends of admedian carinae; remainder of frons bare; vertex with narrow band of appressed filiform hyaline or metallic scales; underside of head with rather sparse scales of various shapes and sizes (large and dense around laryngeal pit) but usually with only small filiform scales below eye. *Rostrum* × 1·2 (♂), × 1·15 (♀) as long as broad, distinctly widening apically and apex rounded in profile view (Text-fig. 7); epistome flat or evenly concave, strongly pitted and with

numerous flanking setae of various sizes; median carina rounded, smooth, more or less strongly arched and somewhat projecting over the very deep transverse furrow; sides of dorsal area strongly raised above antennal insertions, declining evenly to transverse furrow and making a very obtuse angle with frons; oblique basal sulci shallow; dorsal area covered with large loose oblong scales and small whitish setae; a few similar scales below, near base of scrobe; elsewhere bare or with small elongate whitish scales and large hyaline or brownish setae. *Antennae* with lengths of funicle segments 1–3 in ratio 2·1 : 1·5 : 1 (mean of twenty-two), 4–7 subequal, slightly shorter than 3; club fusiform; scape and funicle densely squamose throughout, scales small, oblong-elongate, pale grey. *Prothorax* transverse: ♂, 10 : 15–17 (mean of fifteen, 16·17); ♀, 10 : 16·2–18·6 (mean of twenty-two, 17·56), usually broadest about middle, sides moderately rounded anteriorly, usually weakly rounded or subparallel posteriorly; anterior constriction variable, post-ocular lobes large, evenly rounded or somewhat angular; anterior transverse stria obscure, posterior present towards sides only; anterior border of upper surface fairly even, smooth or microreticulate, with large and small punctures; remainder of upper surface with irregular shiny granules and transverse granuliform wrinkles; interspaces microreticulate or microrugose, matt; vestiture variable but scales dense or imbricate in anterior constriction, on prosternum and above coxae where they form one or more small discrete patches or more extensive tracts; setae as on frons. *Scutellum* with punctures and at least partly microrugose with a few setae and elongate metallic green scales. *Elytra* dimorphic: male elongate-ovate (10 : 5·9–6·5), weakly and evenly convex in profile view, apex rounded; female broader (10 : 6·2–7), more strongly contracted apically, apex acuminate; humeral tubercle basal, small or obsolete in both sexes; post-humeral tubercle just below stria 9, very small and sharp, or obsolete, in both sexes; further tubercles often present in shoulder region and along interstriae 8 and 9; striae weakly impressed throughout; strial punctures variable both in size and degree of definition; interstriae flattened throughout, even on declivity, tightly zigzag or more irregularly deformed by strial punctures, generally uneven or obscurely granulate but surface smooth or very finely rugose, with diffuse punctures; apex, especially in male, finely and strongly rugose, appearing shrivelled; scales usually confined to strial punctures but often most of sides below stria 8 with continuous imbricate scales, especially in female, those on stria 9 extending to apex; setae inconspicuous, white in punctures, brownish elsewhere. *Legs* red-brown, dark red or blackish red according to adult age of specimen at death; tarsi always black dorsally, sometimes also apices of tibiae and parts of coxae; each femur with small black spot (or larger patch) on anterior and posterior faces of knee; fore femora strongly swollen, middle and hind ones less so; fore tibiae somewhat incurved towards apex; all tibiae very weakly bisinuate; tibial teeth small, subequal, except on hind tibiae of male where they are larger, unequal and tuberculiform; posterior (inner) faces of hind femora and tibiae covered with wart-like tubercles; corbels large, with few to many adventitious setae; femora substantially bare but with a few broad scales and numerous very small filiform scales in ill-defined tracts mainly on dorsal and ventral surfaces; tibiae with dense grey or olive-brown scales along dorsal edge and at apex, elsewhere with sparse, mainly elongate metallic scales; tarsi with very dense (but not imbricate) pale grey scales; setae distinct, hyaline, semi-recumbent on femora and tibiae (sometimes dark at apex of both), blackish on tarsi. *Venter* and *thoracic sterna* finely rugose throughout; male with post-coxal cavities broad and deep and ventrites 1 and 2 with discrete shiny granules; female with post-coxal cavities linear or obsolete and granules very small and scattered; scales mainly small or setiform but larger scales present on mesosternal process, mesepisternum, mesepimeron, most of metasternum, metepisternum and often also on central parts of ventrites 1 and 2 and at sides of 3–5. *Aedeagus* (Text-fig. 44) slender, terete, smooth, not or very weakly widening apically, evenly curved; apex blunt, strongly swollen, tip deflexed. *Ovipositor* with valves compressed.

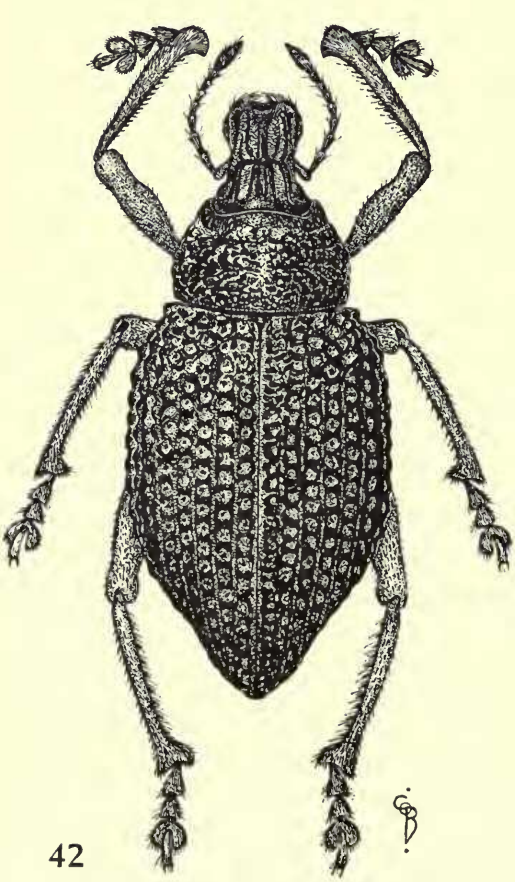
Holotype ♂. Western Australia: Fremantle, 1953 (*E. C. Chapman*), B. M. 1954–78, in the Western Australian Museum, Perth.

Paratypes. 8 ♂, 15 ♀, same data as holotype (15 BM(NH), 3W, 3V, 2S); 2 ♂, 5 ♀, ditto but 1956 and B.M. 1957–71 (BM(NH)); 1 ♂, 6 ♀, same locality, 1879 (*Dr.*

Legge); 7 ♀, same locality, vii.1901 (*J. J. Walker*) (all Oxford); 4 ♂, 3 ♀, ditto but without date, *via G. C.* Champion coll. (BM(NH)); 2 ♂, same locality, i.1946 and 24.xii.1948 (*F. H. Uther Baker*) (FHUB); 3 ♀, ditto but without date (V); 1 ♀, same locality, viii.1953 (*H. Demarz*) (Frey); 1 ♂, 3 ♀, same locality, 1614, 1612, 1613, 1645, all [18]91–49 (BM(NH)); 1 ♂, 1 ♀, East Fremantle, 7.i.1948 (*F. H. Uther Baker*); 1 ♀, ditto but 14.i.1948; 1 ♂, ditto but 20.i.1948; 2 ♂, ditto but 10.x.1948; 1 ♀, ditto but iii.1949 (all FHUB); 1 ♂, same locality, 10.x.1948 (*F. H. Uther Baker*) (A); 2 ♂, 2 ♀, Perth, 11.xi.1933 (*R. A. Lever*); 1 ♂, 1 ♀, same locality, 18.ix.1923 (*G. A. K. Marshall*); 1 ♂, same locality, 1–7.ii.1914 (*R. E. Turner*); 1 ♂, 1 ♀, ditto but 5–9.xi.1935 and 10–18.ii.1936 (all BM(NH)); 1 ♂, 2 ♀, same locality, ix.1953 (*Demarz*) (2 Frey, 1 BM(NH)); 31 ♂, 31 ♀, Perth district, x.1954 (*H. Demarz*) (57 Frey, 3 V, 2 BM(NH)); 1 ♂, 1 ♀, ditto but xii.1953 (Frey); 1 ♂, 1 ♀, same locality, viii (*Mjöberg*); 1 ♀, same locality, K 13461 (all A); 1 ♂, 3 ♀, same locality, i.1939 (*F. E. Wilson*) (FEW); 3 ♂, same locality, 6.ix.1912 (*G. H. Hardy*); 1 ♂, same locality, 1900 (*K. J.*); 1 ♂, South Perth; 1 ♂, 3 ♀, Mount Yokine, 15–16.xii.1956 (*I. M*[*urray*]); 1 ♂, ditto but 8.xii.1956; 1 ♀, ditto but 27.i.1958; 1 ♂, 2 ♀, Wembley, 20.x.1956 (*I. M*[*urray*]); 2 ♀, ditto but 10.xi.1957 (all V); 2 ♂, King's Park, 27.iii.1957 and 17.vi.1957 (*L. Lai*); 1 ♂, same locality, 4.ix.1959 (*K. J. Betjaman*); 1 ♀, same locality, 3.x.1956 (*L. Muhling*); 1 ♀, same locality, 20.iv.1953 (*Bornemissza*) (all UW); 1 ♀, same locality, 17.viii.1912 (*G. H. Hardy*); 1 ♀, Nedlands, 9.xi.1912 (*G. H. Hardy*) (both V); 2 ♀, same locality, vi.1941 and 3.viii.1941 (*D. Sandars*); 1 ♀, same locality, 11.iv.1948 (*J. W. Shield*); 1 ♀, East Guildford, 13.vii.1941 (*D. Sandars*); 1 ♂, 1 ♀, Crawley, iii.1955 and iii.1957; 1 ♂, same locality, 17.x.1956 (*L. Muhling*); 1 ♀, same locality, 14.v.1946 (*K. H. Ooi*); 1 ♂, 2 ♀, Mount Lawley, 16.ix.1953, 4.xi.1954 and 9.xi.1954 (all *J. Cohen*); 2 ♂, 1 ♀, Melville, 11.xii.1958, 20.xii.1958 and 12.x.1959 (*W. Lane*); 1 ♂, Leederville, 4.i.1955 (*K. H. Ho*); 1 ♀, Floreat Park, 13.x.1954 (*G. Anastas*); 1 ♂, West Swan, 18.vi.1956 (*P. Bailey*); 1 ♂, Cottesloe, 21.x.1953 (*T. Lee*); 1 ♂, same locality, 30.ix.1956 (*P. Bailey*) (all UW); 1 ♀, same locality, 16.i.1962 (*J. Daid*) (NSWAg); 1 ♂, same locality, 3.viii.1908 (*G. E. Bryant*) (BM(NH)); 1 ♂, Claremont, ii.1910 (V); 1 ♂, Subiaco, 12.v.1923 (*S. Thomas*) (A); 1 ♀, Maida Vale, 31.viii.1946 (*R. P. McMillan*) (W); 2 ♂, 1 ♀, Applecross, 12.xii.1958 (*F. H. Uther Baker*); 1 ♂, ditto but 1.iii.1959 (all FHUB); 1 ♂, Midland Junction, 23.xi.1957 (*I. M*[*urray*]) (V); 1 ♀, Kenwick, 1960/1961 (*H. Demarz*) (Frey); 1 ♀, near Kenwick, 20.vii.1960 (*H. Demarz*) (Munich); 1 ♀, Jandakot, 30.xi.1947 (*F. H. Uther Baker*) (FHUB); 2 ♀, Maylands (*J. Clark*) (BM(NH)); 3 ♂, 2 ♀, Swan River (*Lea*) (3 BM(NH), 2 Dresden); 1 ♂, 2 ♀, same locality (*L. J. Newman*) (2 (BM(NH), 1 UW); 1 ♂, same locality (*Baly*); 1 ♀, same locality (*J. Clark*); 1 ♀, same locality (*De Boulay*), *via* A. Fry coll. (all BM(NH)); 4 ♂, 9 ♀, same locality (no further data) (7 BM(NH): 3 D. Sharp coll., 2 F. P. Pascoe coll., 2 A. Fry coll.; 1 Stockholm: Chevrolat coll.; 1 Macleay: Masters coll.); 1 ♂, Wanneroo, 3.xi.1935 (*R. E. Turner*); 1 ♂, same locality, 17.ix.1905 (*H. M. Giles*) (both BM(NH)); 13 ♂, 16 ♀, 2 mls. W. of Bullsbrook, 13.xii.1961 (*E. B. Britton* and *A. Douglas*) (25 BM(NH), 4 W); 2 ♀, Gingin; 1 ♀, same locality, 11.ii.1904 (*H. M. Giles*) (all BM(NH)); 1 ♂, same locality, 13.ix.1959 (*F. H. Uther Baker*) (FHUB); 4 ♂, 3 ♀, Yanchep, 13–23.xi.1935 (*R. E. Turner*); 1 ♂, 1 ♀, ditto but 3–19.xii.1935 and 24.xi–2.xii.1935; 1 ♀, ditto but

1–7.i.1936 (all BM(NH)); 1 ♀, same locality, 7.xii.1962 (*F. H. Uther Baker*) (FHUB); 3 ♂, 4 ♀, Moore River, 7.xii.1962 (*F. H. Uther Baker*) (4 FHUB, 3 BM(NH)); 1 ♀, Lancelin, 7.xii.1962 (*F. H. Uther Baker*) (FHUB); 1 ♂, 7 ♀, Geraldton (*J. Clark*) (6 BM(NH), 2 S); 1 ♀, same locality (no further data) (BM(NH)); 2 ♀, same locality, 15.viii.1926 (BM(NH)); 1 ♂, Mullewa (*Miss F. May*) (S); 1 ♂, Baandee, 11.iii.1918 (V); 1 ♂, Jubuk, vi.1952 (UW); 1 ♀, ' Harvey Ag. Area ', K 10849; 1 ♂, 2 ♀, K 38841, K 10849, K 38842 (no further data) (all A); 1 ♂, 1 ♀, Bunbury, 1–20.x.1958 (*A. Snell*) (A); 9 ♂, 9 ♀, without precise localities (various collections) (11 BM(NH), 3 A, 2 Stockholm, 1 Macleay, 1 Oxford). Total: 326 specimens.

Localities: Perth area; Wanneru; Bullsbrook; Yanchep; Gingin; Moore River; Lancelin; Harvey; Bunbury. The records listed above for Geraldton and Mullewa are regarded as dubious; those for Baandee and Jubuk are probably false as are others, not listed, for King George Sound (*Spence*); Queensland (Sharp and Fry colls.) (all BM(NH)); Stanthorpe, Q. (NSWAg); Sydney, N.S.W., 1958, 1960 (*Nikitin*); New Castle, N.S.W. (all Frey); South Africa (*Dr. Smith*), [18]44–6 (BM(NH)).



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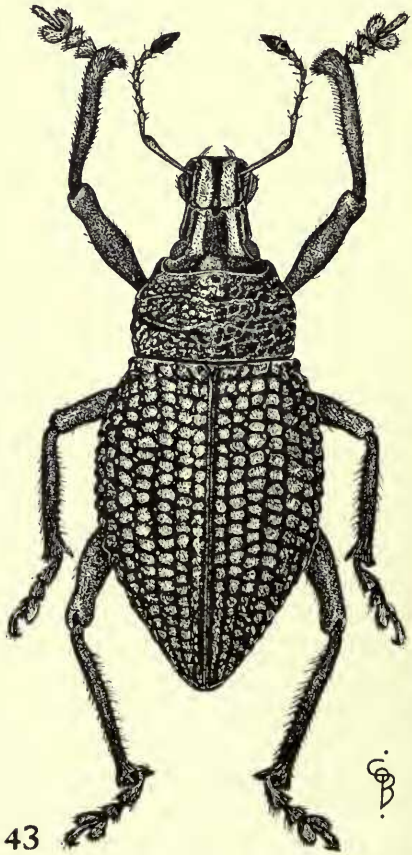

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FIGS. 42, 43. 42, *Catasarcus asphaltinus* sp. n. ♀. 43, *C. longicornis* Pascoe ♂.

Host-plants: *Casuarina* sp. (Perth, Maida Vale, 31.viii.1946 (*R. P. McMillan*) (W)); *Banksia* sp. (Perth, Cottesloe, 16.i.1962 (*J. Daid*) (NSWAg)). This species is reported as a minor pest in gardens in the Perth area (E. B. Britton, personal communication).

Immature stages. Some observations on these have recently been made by Mrs. P. Sundstrom of Tuart Hill, Perth (personal communication). She found a weevil larva, $\frac{1}{2}$ in. long, pale grey/pink in colour, attached by its jaws to the tap root of a eucalypt sapling 8 in. below the soil surface, near her home. This larva is stated to be identical with first instar larvae of *C. asphaltinus* obtained from captive females. Mrs. Sundstrom describes the eggs as: ' small globular cluster $\frac{1}{2}$ in. beneath soil . . . Cluster contains 12 to 14 eggs $\frac{1}{16}$ in. $\times$ $\frac{1}{20}$ in. White, smooth in texture, cylinder shape rounded at each end. Adhering together with clear sticky fluid '.

This species exhibits considerable variation in size, shape (within each sex, in addition to the elytral dimorphism) and scaling. The lateral frontal carinae vary in degree of curvature and sharpness while the admedian carinae are sometimes abnormally enlarged. The femoral setae vary in size and degree of erectness; in some of the specimens from Bullsbrook they are particularly large and stiff. The scales in this species are very easily lost; the majority of specimens appear quite bare dorsally. A few abnormally densely squamose specimens have been recorded in the Perth area; these often have a narrow sutural stripe covering less than half of the width of interstria 1. Specimens from more northerly localities have progressively denser scales, especially on the venter; those from Moore River and the one from Lancelin resemble *C. pallidiventris* in this respect.

Catasarcus longicornis Pascoe

(Text-fig. 43)

Catasarcus longicornis Pascoe, 1870 : 16, 20.
Catasarcus longicornis Pascoe; Lea, 1918 : 266.

Length 10·5–13·2 mm. Body black, shiny; antennae and legs dark red (tarsi black). Scales rather sparse, greyish white or pink. *Head* with frons distinctly convex; lateral frontal carinae sharp, almost straight and shorter than in *C. asphaltinus* owing to reduction of posterior outward flexure; admedian carinae very short, quickly merging with frons posteriorly but higher than laterals in profile view; median frontal sulcus widening posteriorly; middle of frons with a few fine longitudinal striations; lateral sulci narrowly filled with scales which extend to level of hind margins of eyes but (probably) do not cover admedian carinae. *Rostrum* as in *C. asphaltinus* but median carina more strongly raised and epistome with fewer flanking setae. *Antennae* with lengths of funicle segments 1–3 in ratio 2·2 : 1·37 : 1 (mean of four), 4 and 7 longer than 5 and 6. *Prothorax* transverse (10 : 16·7–17·4) and resembling that of *C. asphaltinus* in all respects. *Scutellum* with punctures and several elongate metallic blue or whitish scales. *Elytra* ovate-acuminate (10 : 6·7–7·0), less convex in male than in female but not as flattened as in *C. asphaltinus*; humeral and post-humeral tubercles usually obsolete or very small; other small round tubercles or raised granules present in shoulder region; striae weakly impressed throughout; strial punctures large, encroaching upon the interstriae which become irregularly zigzag with occasional raised granules near base but without wrinkles or evident punctures; strial punctures filled with scales of same type and arrangement as in typical *C. opimus*; in male, interstriae link up between each puncture producing a reticulate pattern but in the only female available

the links are weak and the scales confluent along each stria as in *C. frontalis*. *Legs* and *underside* much as in *C. asphaltinus* but femora with relatively larger, denser scales (especially ventrally) and granules on ventrite 1 larger and more numerous. *Aedeagus* as in *C. asphaltinus*.

Holotype ♂, with ' West/Australia ' and ' Catasarcus/longicornis/*type* Pasc.' in BM(NH).

Paratype ♂, with ' Champion B. ' (BM(NH)). Pascoe's supplementary collection contains two males from Champion Bay and one female without precise locality. Five specimens seen.

Localities: ? Geraldton.

The species referred to by Lea as ' common about the Swan River, which I have long had as *hopei* ', is probably *C. cygnensis*, which somewhat resembles *C. longicornis* superficially.

Catasarcus cygnensis sp. n.

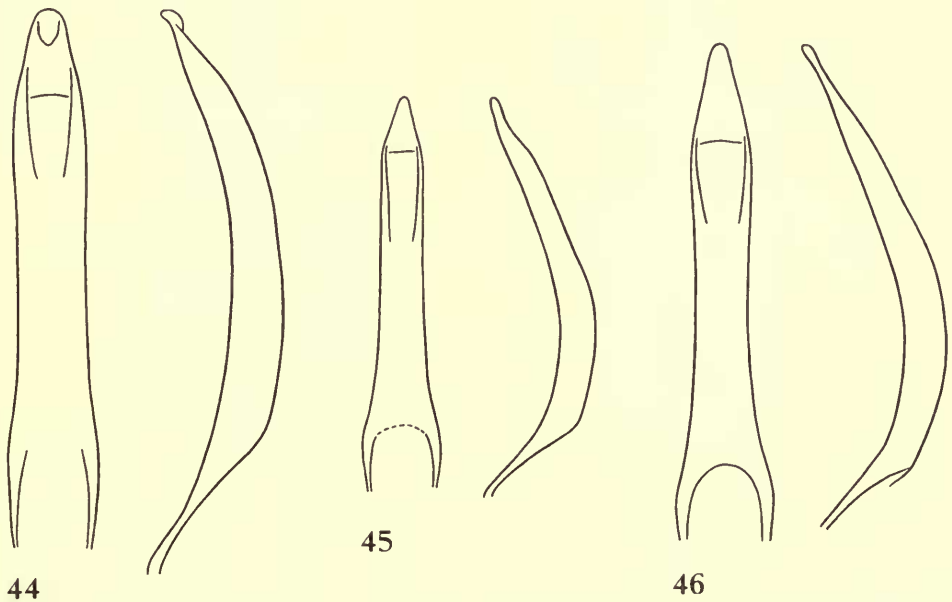
(Text-figs. 45, 47, Map 3)

Length 8·2–14 mm. Body black, antennae and legs dark red or red-brown (tarsi black). Scales whitish or pearly; whitish or pale yellow powdery exudate present. *Head* with frons weakly convex; frontal carinae variable, usually subequal in length; laterals straight or curved, sharp or rounded (rarely almost obsolete), weakly to strongly converging anteriorly; admedian carinae broader, straight or curved, closer to laterals than to each other (equidistant anteriorly); centre of frons smooth or finely striate, rarely with any median elevation; lateral sulci narrow, deep to very shallow, filled with round or ovate scales; admedian carinae sparsely covered with smaller ovate scales; underside of head with large ovate appressed scales around laryngeal pit and sparse small elongate scales elsewhere. *Rostrum* × 1·2–1·3 (♂), × 1·1–1·2 (♀) as long as broad, scarcely widening apically; epistome triangular, irregularly pitted, microreticulate, disc often strongly depressed and a single tuft of 2–3 flanking setae on either side; median carina weakly to strongly raised and usually arched; dorsal area usually subrectangular; lateral sulci deep, filled with large ovate scales (smaller beside epistome); oblique basal sulci sometimes very large. *Antennae* with lengths of funicle segments 1–3 in ratio 2·3 : 1·6 : 1 (mean of nine), other segments as in *C. asphaltinus*. *Prothorax* transverse (10 : 15·8–17·6), sides weakly and evenly rounded, only moderately converging anteriorly; post-ocular lobes well developed, somewhat angulate and with relatively long white vibrissae; dorsal surface weakly rugose or finely but obscurely granulate and with scattered punctures; sides more strongly granulate but seldom with discrete raised granules; anterior transverse stria usually obsolete, posterior present towards sides only; underside and sides with ovate, often imbricate scales which often encroach (less densely) on dorsal surface; latter otherwise bare or with small filiform scales; setae hyaline. *Scutellum* smooth, with scattered punctures (often confined to base) and a few very small filiform scales. *Elytra* ovate in male (10 : 6·3–6·8) and with declivity oblique; in female sub-oblong, slightly broader on average (10 : 6·6–6·9) and with declivity vertical; humeral tubercle absent or obsolete (rarely well developed); post-humeral tubercle very small or obsolete; striae weakly impressed throughout; strial punctures on disc equal in size and regular in arrangement; interstriae of equal width, convex, weakly sinuous and segmented, sometimes with narrow trans-strial links but rarely with continuous folds; strial punctures filled with round or oblong scales which cover sides beyond stria 8 (at least in anterior half) and form continuous tracts along striae posteriorly; setae in and around punctures white and fairly conspicuous, those along interstriae brown and inconspicuous. *Legs* with tarsi black or very dark (colour obscured by scales in fresh specimens); knees sometimes darkened; femora distinctly swollen; fore tibiae incurved very near apex, middle and hind tibiae usually straight; tibial teeth very small but 1–3

large teeth often present on hind tibiae of male; corbels with a few (usually 2–4) adventitious setae; femora and ventral edges of tibiae with numerous small filiform scales; dorsal edges of tibiae with dense ovate hyaline scales; tarsi densely squamose; setae large and hyaline on femora and tibiae, dark on tarsi. *Venter* and *thoracic sterna* finely rugose; ventrites 1–4 strongly granulate in male, weakly so in female; post-coxal cavities small but often fairly deep in male, shallow or obsolete in female; entire venter and most of meso- and metasternum with dense ovate semi-erect white scales and numerous whitish setae; many (rarely all) scales on venter elongate and closely resembling the setae but ventrite 5 almost always with some large ovate scales on disc. *Aedeagus* (Text-fig. 45) strongly tapering and strongly curved in basal third, thereafter very slender, straight and parallel-sided to phallotreme; apical region evenly tapering, tip narrow, weakly swollen, not at all deflexed.

Holotype ♂. WESTERN AUSTRALIA: Applecross, 5.x.1965 (*F. H. Uther Baker*) in the Western Australian Museum, Perth.

Paratypes. 1 ♂, same data as holotype but ix.1964 (FHUB); 3 ♂, 2 ♀, Swan River (4 V, 1 S); 3 ♂, 3 ♀, same locality (*J. Clark*) (4 BM(NH), 2 V); 2 ♂, same locality (*L. J. Newman*); 1 ♀, same locality, A. Fry coll.; 1 ♂, same locality, [18] 44–105 (all BM(NH)); 1 ♀, same locality, 1869 (*de Boulay*); 3 ♂, 2 ♀, same locality (no further data) (all Oxford); 2 ♀, Perth, 2–4.xi.1935 (*R. E. Turner*); 2 ♀, ditto but 5–9.xi.1935; 1 ♂, ditto but 25.ii–12.iii.1936; 1 ♀, same locality, 17.ix.1923 (*G. A. K. Marshall*); 4 ♂, ditto but 18.ix.1923; 2 ♂, same locality, 11.ix.1933 (*R. A. Lever*) (all BM(NH)); 2 ♀, same locality, x.1913; 1 ♀, same locality (*J. Clark*) (all S); 1 ♂, 4 ♀, same locality, ix.1953 (*H. Demarz*) (4 Frey, 1 BM(NH)); 1 ♂, same locality,



FIGS. 44–46. *Catasarcus* spp. Aedeagus in dorsal and lateral view. 44, *C. asphaltinus* sp. n. 45, *C. cygnensis* sp. n. 46, *C. impressipennis* (Boisduval).

1902 (*A. G. Hamilton*) (NSWAg); 1 ♂, 2 ♀, Perth area, xii.1953 (*H. Demarz*) (2 Frey, 1 BM(NH)); 10 ♂, 15 ♀, ditto but x.1954 (21 Frey, 3 BM(NH), 1 California); 3 ♀, Fremantle, viii.1953 (*H. Demarz*) (2 Frey, 1 BM(NH)); 1 ♀, Mount Yokine, 15.xii. 1956 (*I. M*[*urray*]); 1 ♀, Kings Park, 8.xi.1947 (*A. B*[*urns*]) (both V); 1 ♂, 1 ♀, same locality, 35–621 and 35–1070 (W); 1 ♂, 1 ♀, same locality, x.1956 (*R. Williams*); 1 ♀, same locality, 10.viii.1954 (*G. Anastas*); 1 ♀, same locality, 8.viii.1954 (*J. Cohen*); 1 ♂, same locality, 11.ix.1954 (*L. E. Koch*); 1 ♀, same locality, 5.iv.1957 (*L. Lai*); 1 ♂, same locality, x.1952 (*Bornemissza*); 1 ♀, Leederville, 9.xi.1955 (*K. H.*); 1 ♂, Dalkeith, x.1957 (*C. M. Puder*) (all UW); 1 ♂, 1 ♀, West Perth, viii.1937 (*R. P. McMillan*) (W); 1 ♀, South Perth, 21.x.1902 (*H. M. Giles*); 1 ♂, 1 ♀, same locality (no further data); 2 ♂, 1 ♀, Fremantle (*J. J. Walker*); 2 ♂, 2 ♀, same locality, [18] 91–49 (one with label in Marshall's hand: ' J. J. Walker, H. M. S. Penguin Nov. 1890 ') (all BM(NH)); 1 ♀, same locality, 1879 (*Dr. Legge*) (Oxford); 2 ♂, Peel Estate, 2.ix.1951 (*F. H. Uther Baker*); 1 ♂, 1 ♀, ditto but 3.ix.1951; 1 ♀, ditto but 12.i.1952; 4 ♀, ditto but 1.i.1954 (7 FHUB, 2 BM(NH)); 1 ♀, Jandakot, 49–1027 (W); 1 ♀, same locality, 30.xi.1947 (*F. H. Uther Baker*) (FHUB); 1 ♀, Jandicot, 6.iv.1946 (*K. H.*) (UW); 1 ♂, Forestdale, 32–2682 (W); 1 ♂, 3 ♀, Darling Ranges (*Lea*) (2 S, 1 V, 1 Dresden); 1 ♀, Mandurah (V); 1 ♀, Pinjarrah (*Lea*) (S); 4 ♀, Bunbury, 4.xi.1948 (*F. E. Wilson*) (FEW); 1 ♂, 3 ♀, Yanchep, 7.xii.1962 (*F. H. Uther Baker*) (2 FHUB, 2 BM(NH)); 1 ♂, 1 ♀, Moore River, 7.xii.1962 (*F. H. Uther Baker*) (BM(NH), FHUB); 1 ♀, Geraldton (*J. Clark*); 1 ♂, no locality, Bowring coll.; 1 ♂, ditto, Pascoe coll.; 1 ♀, ditto, Fry coll.; 1 ♂, 2 ♀, ditto, Marshall coll. (all BM(NH)); 1 ♀, ditto, Chevrolat coll. (Stockholm); 1 ♂, ditto, Tylden coll.; 2 ♀, ditto, Hope coll. (one with segments 3 and 4 of both antennae fused together) (all Oxford). Total: 141 specimens.

Localities: Perth and environs; Yanchep; Moore River; Jandakot; Forrestdale; Mandurah; Pinjarra; Bunbury. The single record for Bunbury requires confirmation; that for Geraldton is probably false.

Host-plants: *Casuarina* sp. (Perth, 18.ix.1923 (*G. A. K. Marshall*) (BM(NH)); *Xanthorrhoea* sp. (Darling Ranges (*Lea*) (S)).

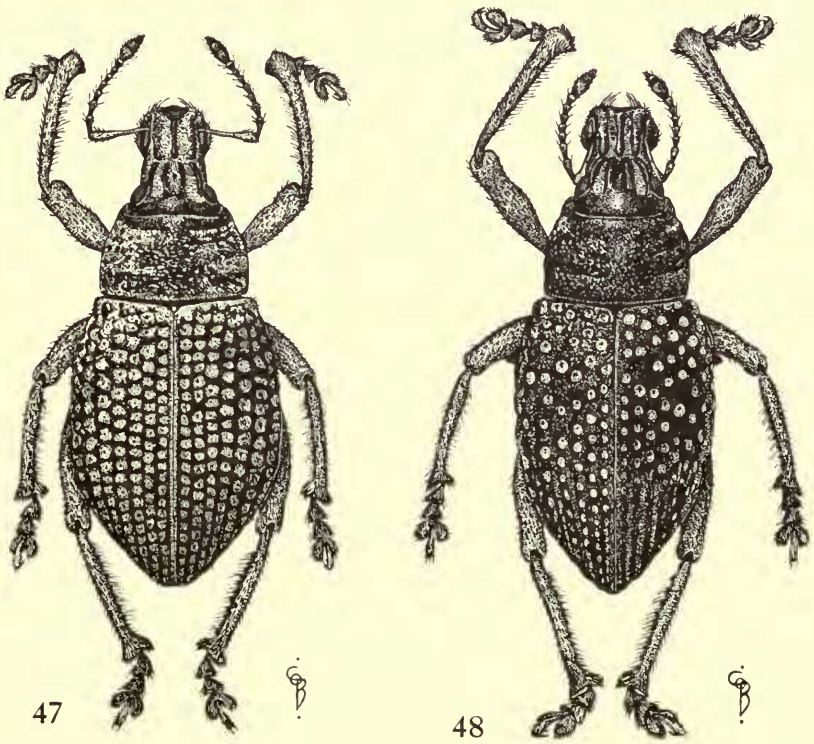
This species is notable for the extremely pale colour of its powdery exudate (when fresh). The name was proposed by Marshall (i. litt.).

Catasarcus coruscus sp. n.

(Map 3)

Length 9·1–14·3 mm. Body black, legs and antennae dark red. Scales pearly white (sometimes greenish or coppery); setae hyaline; pale yellow powdery exudate sometimes present. *Head* with frons weakly to moderately convex; lateral frontal carinae raised, fairly sharp, straight or at most weakly curved or sinuous and distinctly converging anteriorly; admedian carinae at least as long as laterals, usually narrow (sometimes very broad), straight, parallel or weakly converging anteriorly, often higher than laterals and then weakly arched; all four carinae usually equidistant from one another; median sulcus very deep anteriorly; centre of frons (between admedian carinae) with longitudinal striations or one or more narrow carinulae (sometimes without either); lateral sulci deep and narrow, widening posteriorly and filled with round or ovate scales which extend posteriorly at least to level of hind margins of eyes and cover

ends of admedian carinae anteriorly; underside with large patch of imbricate oblong scales below eye; similar but less dense scales also present around laryngeal pit. *Rostrum* of same proportions as in *C. cygnensis*, weakly widening apically; epistome as in *C. cygnensis*; median carina broadly rounded to rather sharp, smooth and level anteriorly, weakly raised posteriorly; dorsal area usually subrectangular, sulci usually deep, with large ovate or oblong scales very dense at base and over oblique basal sulci but rarely extending beyond. *Antennae* with lengths of funicle segments 1–3 in ratio 2·16 : 1·5 : 1 (mean of seven), 4–6 progressively shorter, 7 ≃ 3 or 4 and about × 1·3 as long as broad. *Prothorax* transverse (10 : 16·3–18), sides straight or weakly rounded and parallel or weakly converging anteriorly in male, distinctly rounded and converging in female; post-ocular lobes as in *C. cygnensis*; dorsal surface very weakly to strongly rugose or obscurely granulate, usually with discrete raised granules at sides; transverse striae variable, sometimes strongly marked; most of underside with large imbricate scales which extend along anterior constriction and along sides to hind angle; similar scales (often mixed with small elongate ones) sometimes form an ill-defined tract along hind margin and two admedian patches anteriorly but dorsal surface often bare; setae hyaline. *Scutellum* smooth (sometimes rugose at base) with a few fine punctures and filiform scales. *Elytra* ovate in male (10 : 6·3–7) oblong-ovate in female (10 : 6·8–7·2); humeral tubercle variable, rounded, usually basal, rarely very large and cariniform; post-humeral tubercle usually small, sharp and strongly reflexed posteriad, mounted on a low broad bulge; striae and punctures either as in *C. impressipennis* (but with punctures more regular) or with striae more strongly impressed and interspaces more strongly raised, interstriae often segmented and the segments uniting to form weak irregular transverse



FIGS. 47, 48. 47, *Catasarcus cygnensis* sp. n. ♀. 48, *C. impressipennis* (Boisduval) ♂.

folds (in both sexes); scales dense in punctures (which are often distinctly pupillate), along striae on declivity and continuously imbricate along sides beyond stria 8 (except in apical third); very small ovate or elongate scales sometimes present around punctures, along suture and at apex; setae very inconspicuous except sometimes on declivity. *Legs* as in *C. cygnensis* but tarsi red; hind femora (only) in some fresh specimens with an ovate patch or elongate tract of large scales along both dorsal and ventro-lateral aspects in distal half; corbels usually bare but sometimes with 1–4 adventitious setae. *Aedeagus* as in *C. cygnensis* but tip slightly broader and very weakly deflexed.

Holotype ♂. WESTERN AUSTRALIA: Yallingup, [19]45–771, in the Western Australian Museum, Perth.

Paratypes. 2 ♂, 2 ♀, same data as holotype but 45–772 to 45–775; 1 ♂, 2 ♀, ditto but 44–689, 44–690 and 42–633 (all W); 1 ♂, 2 ♀, same locality, 14.ix–31.x.1913 (*R. E. Turner*); 1 ♂, 1 ♀, ditto but 1.x.1913; 2 ♂, ditto but xi.1913; 1 ♂, ditto but 1–12.xii.1913; 1 ♂, 1 ♀, ditto but 23.xii.1913–23.i.1914 (all BM(NH)); 1 ♂, same locality, 1.x.1951 (*I. F. B. Common*) (CSIRO); 6 ♂, 4 ♀, Dunsborough, 42–230 to 42–239; 1 ♂, 3 ♀, East Witchcliffe, 45–507 to 45–510; 1 ♂, 2 ♀, Calgardup, 40–1600, 40–1601 and 40–1598; 1 ♀, Forest Grove, 34–1707; 1 ♀, Busselton, 47–301 (all W); 1 ♂, 1 ♀, Busseltown, 17.iii.1957 (*A. Snell*); 2 ♀, Cape Naturaliste, 6.iii.1958 (*A. Snell*); 1 ♀, Bunbury, 13.i.1957 (*A. Snell*) (all V); 4 ♂, 5 ♀, Karridale, ii.1959 (*H. Demarz*) (6 Frey, 3 BM(NH)); 3 ♂, 1 ♀, same locality, 24.i.1950; 1 ♂, 1 ♀, ditto but 22.i.1965; 1 ♂, Yelverton, 13.x.1962; 1 ♂, Meelup, xi.1953; 1 ♂, Augusta, xii.1952 (all *F. H. Uther Baker*) (all FHUB); 1 ♂, Kudardup, 23.i.1965 (*F. H. Uther Baker*) (BM(NH)); 2 ♂, Ludlow (*J. Clark*); 1 ♂, Yarloop, 8.xi.1948 (*F. E. Wilson*) (all FEW); 2 ♂, 2 ♀, Swan River (*L. J. Newman*); 1 ♂, same locality (*J. Clark*); 1 ♂, 1 ♀, Albany (*J. Clark*); 1 ♂, Champion Bay, Pascoe coll. (all BM(NH)). Total: 73 specimens.

Localities: Augusta; Kudardup; Calgardup; Karridale; Forest Grove; Witchcliffe; Yelverton; Yallingup; Cape Naturaliste; Meelup; Dunsborough; Busselton; Ludlow; Bunbury; Yarloop. The records for Swan River and Albany are probably false and that for Champion Bay certainly is.

This species exhibits an astonishing range of variation in the sculpture of the elytra, especially in the male. At one extreme the disc of the elytra is flat, with large round scale-filled punctures and no trace of striae, while at the other the striae are deeply impressed throughout, the interstriae convex (segmented or not) and the punctures reduced, their scales coalescing along the striae.

A specimen in the Hope collection (Oxford) (Plate 1, Fig, 5), at first regarded as a distinct species, is now thought to be an extreme variant of this species. The striae are impressed throughout and the interstriae strongly convex, smooth and shiny, for the most part straight or weakly sinuous, increasing in width towards the sides. The strial grooves are uniformly filled with mostly small scales which all but obscure the punctures in striae 1–5; those in striae 6 and 7 are much larger and encroach upon the very broad interstria 7, making the latter strongly sinuous. The elytral sculpture of the Kudardup specimen is intermediate between that of the Oxford specimen and the other paratypes. The Oxford specimen resembles *C. coruscus* in other respects except that the prothorax is narrower (10 : 15·8) and the

aedeagus is parallel-sided in the middle (weakly constricted there in *C. coruscus*). It measures 12 × 5·6 mm. and bears no contemporary labels.

Catasarcus laevior sp. n.

(Map 3)

Length 9·6–13·3 mm. Body black, antennae and legs dark red (coxae black). Scales usually greenish white but sometimes golden or coppery, especially ventrally; setae pale except on tarsi and elytra; yellow-brown powdery exudate present. *Head* as in *C. impressipennis*. *Rostrum* × 1·1–1·2 (♂), × 1–1·1 (♀) as long as broad, distinctly widening at genae; epistome usually flat; otherwise as in *C. impressipennis*. *Antennae* with lengths of funicle segments 1–3 in ratio 2·5 : 1·7 : 1 (mean of three), 7 slightly longer than 6 but only × 1·1 as long as broad. *Prothorax* as in *C. impressipennis* but dorsal surface less strongly, less regularly and less distinctly granulate (sometimes almost smooth on disc); sides with a prominent irregular tract of imbricate scales; underside with a discrete elongate patch above coxa (sometimes very small). *Elytra* less elongate than in *C. impressipennis*: 10 : 6·5–6·7 (♂), 10 : 6·8–7·2 (♀); humeral tubercle obtuse, often obsolete; post-humeral tubercle small to moderate in size, often strongly reflexed posteriad; a few small sharp granules present at sides between humeral and post-humeral tubercles; striae impressed throughout in both sexes; punctures larger towards sides but not as irregular as in *C. impressipennis*; interstriae smooth on disc, finely rugose on declivity, usually strongly convex, sinuous and weakly segmented posteriorly, elsewhere linking up across striae to form a reticulum; punctures filled with scales which are continuous along middle section of interstriae 9 and 10; interstriae with scattered small brown squamiform setae (larger and more numerous on declivity). *Legs* as in *C. impressipennis* but tibial teeth distinctly larger; corbels usually with a few adventitious setae. *Underside* as in *C. impressipennis* but scales (as elsewhere) larger and hence more conspicuous. *Aedeagus* as in *C. impressipennis*.

Holotype ♂. WESTERN AUSTRALIA: Manjinup [Manjimup], 24.x.1952 (*H. F. Broadbent*), B. M. 1953–106, in the Western Australian Museum, Perth.

Paratypes. 2 ♂, 7 ♀, same data as holotype (7 BM(NH), 1 W, 1 V); 1 ♂, same locality, [19]35–3049 (W). Total: 11 specimens.

Host-plants: *Leptospermum* sp. (main series).

Catasarcus impressipennis (Boisduval)

(Text-figs. 4, 46, 48, Map 3)

Cneorhinus impressipennis Boisduval, 1835 : 350; pl. 7, fig. 9.
Cneorhinus stygmatipennis Boisduval, 1835 : 349, **syn. n.**
Catasarcus rufipes Fåhraeus in Schönherr, 1840 : 814.
Catasarcus stigmatipennis (Boisduval) Schönherr, 1840 : 818 [Invalid emendation].
Catasarcus impressipennis (Boisduval) Schönherr, 1840 : 818.
Catasarcus rufipes Schönherr; Labram and Imhoff, 1848, No. 27; fig.
Catasarcus impressipennis (Boisduval); Lacordaire, 1863 : 250 (note) [= *rufipes*].
Catasarcus stigmatipennis (Boisduval); Pascoe, 1870 : 18.
Catasarcus pollinosus Pascoe, 1870 : 16, 23, **syn. n.**
Catasarcus foveatus Pascoe, 1870 : 16, 24, **syn. n.**
Catasarcus maculatus Pascoe, 1870 : 16, 25, **syn. n.**
Catasarcus mollis Lea, 1909*a* : 157, **syn. n.**
Catasarcus durus Lea, 1909*a* : 158, **syn. n.**
Catasarcus pollinosus Pascoe; Lea, 1918 : 265 [= *maculatus*].

Length 9·7–16·6 mm. Body black, legs and antennae red or dark red. Scales greenish white or golden yellow (metallic or not), small and sparse except in elytral punctures and there usually obscured by yellow powdery exudate; setae pale. *Head* with frons weakly to strongly convex; lateral frontal carinae (Text-fig. 4) strongly raised, rather sharp, strongly curved (if only weakly curved then strongly converging); admedian carinae as long as laterals, broad, rounded, often swollen anteriorly, usually weakly to very strongly curved, at least outwardly; median sulcus opening widely posteriorly; centre of frons smooth or with longitudinal striations or sometimes with a smooth median elevation; lateral sulci deep and narrow, especially anteriorly, and filled with ovate or ovate-elongate scales (at least posteriorly); underside of head with ovate scales around laryngeal pit and very small scattered filiform scales elsewhere. *Rostrum* × 1·2–1·3 (♂), × 1·1–1·2 (♀) as long as broad, distinctly widening apically; epistome triangular, disc flat or concave, sometimes strongly so (posterior margins then cariniform); two or three flanking setae in a puncture on each gena; median carina rounded, not or weakly raised, level or weakly arched; dorsal area subrectangular, lateral sulci usually deep, with at most a few ovate and very small elongate scales posteriorly in region of oblique basal sulci which are variably developed or obsolete. *Antennae* with lengths of funicle segments 1–3 in ratio 2·3 : 1·5 : 1 (mean of seven), 4–6 < 3, subequal; 3 and 7 subequal, 7 about × 1·25 as long as broad. *Prothorax* transverse (10 : 15·2–17·4), subcylindrical in some males, broadest at or near base in female with converging, weakly rounded sides; anterior constriction weak, post-ocular lobes well developed, sometimes angulate, upper surface and sides finely, densely and uniformly granulate, appearing matt to the unaided eye in strong contrast with the shiny elytra; individual granules on disc often grossly mis-shapen or with a large eccentric setiferous puncture; those at sides more regular, less dense, interspaces microrugose and with numerous microgranules; anterior transverse stria obscure or absent, posterior present at sides only; entire dorsal surface usually bare but some fresh specimens with very small elongate greenish scales scattered throughout; larger ovate golden scales on prosternum, along anterior constriction and sometimes on sides and at hind angles. *Scutellum* variable (sometimes obsolete), usually with dense shallow punctures and a few filiform scales. *Elytra* ovate-elongate in male (10 : 5·8–6·5), evenly rounded at sides, sometimes only × 1·3 as wide as prothorax; in female, more broadly ovate (10 : 6·4–7), more strongly rounded posteriorly and with somewhat steeper declivity; humeral tubercle variable, basal, often obsolete; post-humeral tubercle small, sharp, reflexed posteriad; male usually with striae impressed on declivity only, surface elsewhere quite even, smooth or finely rugose, strial punctures round, very small near suture, becoming much larger and fewer towards sides and very irregular in size and arrangement (in same individual) (Text-fig. 48); female usually similar (punctures less irregular) but often striae impressed throughout and interspaces convex, forming a reticulate pattern; scales dense in strial punctures, interspaces (including sides) bare, or (in fresh specimens) with a few small elongate greenish scales; setae very small and very inconspicuous except sometimes on declivity. *Legs* unicolorous; femora weakly swollen; fore tibiae distinctly, middle tibiae weakly, incurved towards apex, hind tibiae straight but ventral edge weakly sinuous; all tibial teeth very small; corbels usually bare, only rarely with a few adventitious setae; femora bare or sometimes with sparse very small elongate scales; tibiae with similar and larger hyaline scales, mostly along dorsal edge and at apex; tarsi with similar small scales, nowhere really dense; setae large and pale (dark on tarsi). *Venter* and *thoracic sterna* finely but strongly rugose throughout; ventrites 1–4 in male with a few small flat granules, much smaller still in female; post coxal cavities fairly large in male, linear or obsolete in female; scales confined to mesosternal process, mesepisterna, mesepimera (usually), metepisterna and narrow tracts across metasternum and ventrite 1 (following transverse impressions on these sclerites) and along anterior border of ventrite 2; elsewhere with exceedingly small and inconspicuous filiform scales or bare (apart from setae). *Aedeagus* (Text-fig. 46) smooth, terete, strongly curved and tapering in basal half; straight apically, weakly widening around phallotreme; ventral surface flattened, dorsal surface strongly convex; apical region weakly and evenly tapering; tip broad, swollen, evenly rounded or subtruncate, not deflexed.

The following specimens are in the Muséum National d'Histoire Naturelle, Paris:

Holotype of *impressipennis*, ♀, with ' Durville, P. G. R.' [Port du Roi-George (= Albany)] under a round label [x.1826]. Unique.

Holotype of *stygmatipennis*, ♂, with ' Durville, P. West ' [Western Port, near Melbourne] under a round label. Unique.

The following specimens are in the Naturhistoriska Riksmuseum, Stockholm:

Holotype of *rufipes*, ♀, with ' *Polyd*: *? rufipes*/Hope./Swan Rivier./N. Holl: Hope'. and ' Typus '. There is also a male specimen in the Schönherr collection labelled ' N. Holl./Hope '.

The following specimens are in BM(NH):

Holotype of *pollinosus*, ♀, with ' West/Australia ' and ' Catasarcus/pollinosus/*type* Pasc.' There are two similar specimens from the Pascoe coll. (one slightly larger than the holotype, the other smaller), each bearing a ' cotype ' label.

Holotype of *foveatus*, ♂, with ' Champion B.' and ' Catasarcus/foveatus/*type* Pasc.' Unique.

Holotype of *maculatus*, ♂, with ' King/George's Sound '. Pascoe's determination label is missing. His series label (' Catasarcus/maculatus Pasc.') was, however, attached to the specimen when it was removed from his cabinet and the locality is unique among his *Catasarcus*. There can be little doubt, therefore, that this is the specimen that Pascoe described.

The following specimens are in the South Australian Museum, Adelaide (unless otherwise stated):

Holotype of *mollis*, ♀, with ' mollis/Lea TYPE/Mt. Barker ' [*R. Helms*]. Paratype, ♀, with ' mollis/Albany ' and ' Cotype ' [*R. Helms*].

Holotype of *durus*, ♀, with ' durus/Lea TYPE/Mt. Barker ' [*A. M. Lea*].

Paratypes: 2 ♀, with ' durss/Mt. Barker ' and ' Co-type ' (1 Macleay).

Over 300 specimens seen.

Localities: Albany; Taylor Inlet; Kalgan; Cheyne Beach; Youngs; Denmark; Nornalup; Mount Barker; Mount Groper. Apparently genuine records have been seen for the following localities, though they are widely separated from the main group: Jubuk; Quindalup; Yunderup; Cardup. More doubtful records have been seen for Kalgoorlie and Norseman and a large number of patently false records, including Geraldton, Kojarena, Eradu, Western Port, Melbourne, Brisbane, Wallangarra, Hobart, New Guinea, Fiji Is. It is clear from the foregoing that the true range of this species remains to be determined.

Host-plants: *Acacia* sp. (Quindalup, i.1963 (*R. P. McMillan*)(W)); *Xanthorrhoea* sp. (Cardup, 25.x.1952 (*H. F. Broadbent*) (BM(NH))).

I am greatly indebted to Dr. G. Kuschel for finding the types of Boisduval; the following information (and that given in the type-citations above) is taken from his

notes. *C. impressipennis*: 12·6 × 5·2 mm.; in normal condition; legs and antennae almost black. *C. stygmatipennis:* 11·5 × 5·2 mm.; completely sand-blown.

The false locality given for this second specimen, together with its bleached condition, no doubt led Boisduval to regard it as distinct. Lacordaire, who implies that he saw the specimens, also thought they were distinct, though he correctly recognized *C. rufipes* Fåhraeus as a synonym of *C. impressipennis* (Fåhraeus had *not* seen Boisduval's types).

Pascoe accepted Lacordaire's conclusions but misidentified a specimen of *C. asphaltinus* as *C. rufipes*; the (correct) locality of his specimen—Swan River—is the (false) type-locality of *C. rufipes*. Although he was unable to recognize *C. stygmatipennis* in 1870, there was a series-label for it in his collection (now attached to a fresh(!) specimen of *C. impressipennis*). He too may have been misled by the false type-locality given for *C. stygmatipennis*; the specimens which he described as *C. pollinosus* are strongly bleached and must closely resemble the holotype of *C. stygmatipennis* which was clearly described by Boisduval as ' supra cinerascens ' and 'en entier d'un gris-ardoisé mat, plus foncé en dessous qu'en dessus '. The holotype of *C. foveatus* is a somewhat abraded specimen with dark legs; that of *C. maculatus* is very fresh and has bright red-brown legs. Apart from a very slight difference in elytral sculpture, these specimens are very similar.

Lea's observations on *C. pollinosus* are correct and he even suggests that it may be a synonym of *C. impressipennis*. In the next paragraph, however, he quite wrongly sinks *C. memnonius* as a synonym of *C. transversalis* and adds: ' I am also convinced that it is the *Cneorhinus stigmatipennis* of Boisduval . . . ' In the absence of any explanation as to how this conclusion was reached, I can only assume that Lea accepted the false type-locality of *C. stygmatipennis* as genuine and thought that as there was (in his opinion) only one species of *Catasarcus* in eastern Australia, then that described from Western Port must be it. Unfortunately, the nearest genuine record of *Catasarcus* known to me is from a point about 140 miles west of Western Port. This is a fair indication that the locality given for *C. stygmatipennis* is false and since the only other landfall made by the ' Astrolabe ' in Australia was at King George Sound, this must be the true type-locality. Having established this, the identity of both Boisduval's species is clear. *C. impressipennis* is certainly the commonest member of the genus in the area—' The species occurs in abundance at King George Sound and near same ' (Lea, 1918 : 265) and bleached specimens are particularly frequent (about 10 % of collected specimens).

The two species described by Lea in 1909 are based exclusively upon large, or very large, female specimens, two of which are teneral and three mature and abraded. It is hardly surprising, therefore, that Lea failed to equate them with Pascoe's species (though he does mention several points of similarity). What is surprising is that he described two species from the material, including specimens from the same locality in each and that he relied for their separation upon a wholly spurious character, namely the hardness of the cuticle (hence the specific epithets used). Anyone acquainted with the rudiments of entomology knows that the cuticle of otherwise hard insects remains thin and soft for an appreciable time after emergence from the pupa. Although it is true that there is some variation in the final thickness of the

cuticle within the present genus (and that of *C. impressipennis* is especially thick), it is nevertheless unlikely that closely related species will differ *markedly* in this respect. It is worth noting that *typical, male* specimens were taken at Albany by Helms and on Mount Barker by Lea.

Catasarcus inaequalis sp. n.

(Plate 1, Figs. 3, 4)

Length 15–16·5 mm. Body black, legs and antennae dark red. Large whitish (pearly or greenish) scales mainly confined to depressions on elytra; pale brown powdery exudate sometimes present. *Head* as in *C. impressipennis* but with no large scales on underside. *Rostrum* × 1·2–1·3 as long as broad, weakly widening apically and with scarcely any chin ventrally; epistome with disc depressed, microreticulate, and with several flanking setae; median carina broad, smoothly rounded, level, not projecting over transverse furrow, which is narrow, sinuous and rather less deep than in related species; sides of dorsal area broadly rounded and strongly raised, level with median carina; without any large scales but with numerous very small filiform scales forming a kind of general pubescence. *Antennae* with lengths of funicle segments 1–3 in ratio 2 : 1·65 : 1 (mean of three), 6 and 7 as long as broad, 7 distinctly larger than 6; club fusiform, very little broader than segment 7 of funicle; scape and funicle throughout with filiform hyaline scales. *Prothorax* transverse (10 : 16·1–17·3), broadest at or near base; sides subparallel or weakly converging basally, weakly rounded anteriorly; anterior constriction weak, post-ocular lobes very large, evenly rounded; dorsal surface and sides strongly and evenly rugose-granulose, anterior border finely rugose and pitted almost to anterior margin; anterior transverse stria confused, posterior well developed, almost complete; basal marginal stria distinct; large scales confined to region of anterior constriction and a narrow vertical area above coxa; elsewhere with very small filiform scales and small setae. *Scutellum* smooth or finely rugose, with scattered punctures and a few filiform scales. *Elytra* elongate-ovate (10 : 6·2–6·5); humeral tubercle strictly basal, small in male, moderate in female, blunt; post-humeral tubercle small or obsolete; striae distinctly to strongly impressed, especially posteriorly; interstriae either weakly convex and almost smooth, or strongly convex and finely but strongly rugose, 7 much broader than all the others for almost its entire length, 5, 8 and apical part of 9 all usually broader than others; strial punctures mostly large, uniform, filled with large scales except for a central pupil (often plugged with exudate); scales coalesce along certain striae to form stripes, notably 6, 7–9 and apical part of 3; these stripes may also fuse together laterally, thus, in the holotype, most of interstria 6 and apical parts of 4 and 8 are covered with scales; scales on striae 1 and 2 are strictly confined to punctures throughout (almost absent on declivity), so that this region appears as a dark median tract between the pale, striped outer areas; setae generally hyaline (brown on declivity), numerous among scales, sparse elsewhere, about as large as those on prothorax. *Legs* unicolorous, including coxae; femora moderately swollen; fore tibiae and ventral edge of hind tibiae weakly bisinuate, teeth very small; corbels large, bare or with a rather large number of small adventitious setae; vestiture throughout consisting of very small filiform scales and moderate hyaline setae (brownish on tarsi). *Venter* and *thoracic sterna* with similar vestiture to that of legs, large scales confined to lateral part of mesepisternum and greater part of metepisternum (apart from a small number on metasternum in depression behind middle coxa); venter with discrete shiny granules throughout (poorly developed in female); post-coxal cavities cavernous in male, virtually absent in female. *Aedeagus* similar to that of *C. impressipennis* but rather strongly sulcate ventrally near base; single example examined has extensive dorsal sulcus but this may be abnormal.

Holotype ♂. 'W. Aus.' (Chevrolat collection) in Naturhistoriska Riksmuseum, Stockholm.

Paratypes. 1 ♂, with ' W. Australia ' and ' [18]47/109 ' [' Purchased of George Clifton ']; 1 ♀, without locality (*Baly*), with ' Bowring./[18]63.47* ' (both BM(NH)).

It will be noted that the above three specimens were all collected, apparently separately, more than a century ago.

Catasarcus memnonius Pascoe, **sp. rev.**

(Text-figs, 12, 49, 55, Map 1)

Catasarcus memnonius Pascoe, 1870 : 16, 26.
Catasarcus stigmatipennis Boisduval; Lea, 1918 : 265 [Erroneous synonymy].

Length 7·7–11·3 mm. Body black and shiny; legs and antennae very dark red-brown or black. Upper surface devoid of scales; setae brown, those on elytra small and inconspicuous. *Head* with transverse furrow reduced to a sinuous or angulate impressed line (sometimes ill-defined); frons flat, without distinct carinae, sides angular or rounded and irregularly carinulate, weakly converging anteriorly; median sulcus distinct, well defined, usually narrow but with an exceedingly fine micro-carina along the bottom; underside with numerous round white scales but only a few very small ones below eye; eyes usually distinctly convex and about × 1·4 as long as broad. *Rostrum* × 1·4–1·5 as long as broad, weakly widening apically, genae sharply angled (viewed from above); epistome coarsely pitted, sometimes ill-defined, disc depressed, anterior lobes red-brown, right lobe larger than left, two (apparently one) principal flanking setae in a puncture on either side and two or more very small setae in anterior cleft; median rostral carina sharp, tectiform, raised posteriorly, weakly arched and weakly to strongly punctured; oblique basal sulci usually well developed, rendering posterior end of median carina acuminate; underside with scattered scales. *Antennae* with lengths of funicle segments 1–3 in ratio 2·2 : 1·5 : 1 (mean of four), 7 slightly longer than 3 and about × 1·4 as long as broad; scape and funicle with small dense whitish scales. *Prothorax* transverse (10 : 17·8–19·5), broadest about middle or near base; sides rounded, weakly converging anteriorly; post-ocular lobes well developed; anterior transverse stria irregular and usually interrupted in mid-line by an ill-defined cariniform elevation; posterior stria obscure or reduced to a short impression near either side; sides with discrete smooth raised granules which become lower and obscure towards disc; interspaces usually strongly microreticulate or microrugose; underside finely and strongly rugose with small patch of large white scales above coxa. *Scutellum* finely punctured, bare. *Elytra* subglobular (10 : 7·4–8·5); humeral tubercle usually small, sharp; post-humeral tubercle small to fairly large, conical, usually sharp; striae strongly impressed except at sides and apex; disc with sinuous undulating transverse folds, somewhat as in *C. transversalis*; strial punctures on disc obscure, elsewhere very small; interstriae 3, 5 and 7 strongly convex over brow of declivity and each with a row of raised granules (Text-fig. 12) (one granule opposite each adjacent strial puncture interval); similar granules in humeral region and sometimes a few on interstriae 2, 4, 6 and 7; surface almost smooth and brilliant at sides, elsewhere shiny but very finely punctured or microrugose, rarely with a few scales at extreme apex. *Legs* slender, femora scarcely swollen; fore tibiae strongly, middle tibiae weakly, incurved towards apex, teeth small; corbels narrow, filled with dense long golden setae; claw-segment of hind tarsi × 1·1 (♂), × 1·1–1·2 (♀) as long as segments 2 + 3 (overall); femora with at most a few small scales at apex; tibiae and tarsi densely squamose throughout. *Venter* and *thoracic sterna* finely rugose or microreticulate; mesosternum coarsely and densely pitted, intercoxal process broad, often sulcate; ventrites 1 and 2 with a few scattered granules in male only; white or pink scales imbricate on mes- and metepisterna and mesepimera, scattered on mesosternum and sides of metasternum, absent elsewhere. *Aedeagus* (Text-fig. 49) short and broad, strongly curved, strongly and evenly depressed; sides parallel (widening around phallotreme); apex very short, very broadly rounded; tip thin, not deflexed. *Ovipositor* with valves explanate, depressed and weakly divergent.

Holotype ♀, with ' Adelaide ' and ' Catasarcus/memnonius/*type* Pasc.' in BM(NH). Probably unique. Two smaller, male, specimens from Pascoe's main collection, one with ' Adelaide ', the other with ' S. Australia ', may be paratypes and have been so labelled by Marshall and Arrow respectively.

A total of 13 specimens seen.

Localities: Kopperamanna (60 miles E. of Lake Eyre) (S). This record was made by a [South Australian (?)] Museum expedition in 1916. A further six specimens were taken on 26.vi.1927 by G. Horne in ' Central Australia ' (V). Pascoe's record for Adelaide is probably very imprecise. In his paper he erroneously gives ' Victoria ' as the type-locality. The remaining specimens (1 BM(NH), 1 Washington) are without locality data.

C. memnonius is probably the most isolated species in the genus, both geographically and anatomically; the condition of the frons and more especially the extreme reduction of the transverse rostral furrow mark this species off from all the rest. It also has the most elongate rostrum and the longest hind tarsal claw-segment (in relation to segments 2 + 3) of any known species and the genuinely asquamose upperside is unique. Although itself spineless, the explanate ovipositor suggests a closer affinity with the spiny than non-spiny species. The densely squamose corbel resembles that of the quadrispinate *C. intermedius* which also has a rather shallow transverse rostral furrow (though it is furthest from *C. memnonius* geographically). The granules on the declivity of the elytra (Text-fig. 12) have no parallel in the spineless species and may indicate an incipient multispinose condition.

NOTE ON THE QUADRISPINATE SPECIES

Lea (1897 : 591) regarded all the seventeen quadrispinate species described by Pascoe (1870) as synonyms of *C. spinipennis* Fåhraeus. In fact, only two of them are, though of the remaining fifteen names, eight are synonyms and one is of doubtful status. Pascoe described one species no fewer than seven times, thereby demonstrating the truth of his own remark (p. 15) that ' this is one of those genera which prove how much more difficult it is to determine the limits of species than the limits of genera '. The *spinipennis*-group (*C. spinipennis*, *C. nephelodes*, *C. echidna* and *C. albuminosus*) has proved especially difficult to deal with, in spite of the fairly large amount of material available. About a dozen specimens have been seen which clearly belong to this group but do not match up with any of the four species here recognized; two, or possibly three forms are involved but in no case is the material adequate for description.

A character which has proved useful in separating the quadrispinate species is the anterior spine index (described above, p. 368):

	♂	♀
C. intermedius Pascoe	52–59	54–62
C. albipectus sp. n.	45–47	47–54
C. bicolor sp. n.	42–46	55·6
C. echidna Pascoe	32–37	44–49
C. nephelodes sp. n.	41–45	46–49

C. albuminosus Pascoe	37–40	?
C. spinipennis Fåhraeus	42–49	49–55
C. marginispinis Pascoe	45–49	49–53
C. albisparsus Pascoe	48–53	49–53
C. cicatricosus Pascoe	47–52	47–53
C. carbo Pascoe	43–49	49–54

It will be seen that in some species the index-ranges of the two sexes do not overlap, while in others they overlap almost completely.

Catasarcus intermedius Pascoe

(Text-fig. 13, Map 4)

Catasarcus intermedius Pascoe, 1870 : 16, 27.

Length 6·3–10·3 (–12) mm. Black, shafts of femora and dorsal elytral spines very dark red, antennae and tibiae blackish red. Scales fairly dense throughout, mostly white or pearly; setae mostly brown. *Head* with frons usually quite flat and often with parallel supra-ocular carinae but frontal carinae all small and usually subdivided, hence more or less indistinct; smooth median frontal carina often present between eyes, usually very small but sometimes large; eyes × 1·4 as long as broad, smaller and more strongly convex than in *C. spinipennis*; behind eye a distinct but ill-defined groove with concentric accessory striae; frons smooth or finely microreticulate, with fairly dense large round white or pearly scales and erect strongly curved brown setae; underside of head with dense, mainly oblong scales throughout. *Rostrum* × 1–1·2 as long as broad, progressively widening apically; epistome more or less flat, strongly pitted, with scattered setae and (posteriorly) small ovate scales; median carina narrow, usually quite level (sometimes raised at extreme base); transverse furrow shallower than in all other quadrispinate species, hence median carina and hind corners of dorsal area not, or but weakly, projecting posteriorly over it; oblique flange above scrobe smaller than in other species and with longitudinal cariniform swelling (often very ill-defined); scales as on head; setae slender, white or hyaline. *Antennae* with lengths of funicle segments 1–3 in ratio 3 : 1·3 : 1 (mean of eight); club stouter than in other quadrispinate species (2 : 1); scape and funicle with imbricate grey scales throughout. *Prothorax* transverse (10 : 15–17·5), broadest before middle; sides straight, parallel or weakly converging posteriorly; anterior constriction deep; post-ocular lobes prominent and sharply angulate; transverse striae both complete and very strongly impressed but rather irregular; dorsal surface (behind anterior stria) very uneven and strongly but irregularly granulate; sides with even stronger but more regular granules; scales fairly dense, some white or grey (sometimes in ill-defined patches) mixed with bronzy scales of similar size; setae small and brown. *Scutellum* not, or not abruptly raised above general level of mesonotum (adjacent portions of elytra hence depressed); surface punctured, usually covered with small ovate scales. *Elytra* shortly ovate-acuminate (10 : 7·2–7·7); humeral tubercle usually obsolete in male, moderate to large in female; a smaller granule often present at base of interstria 5; post-humeral bulge usually with large recurved tubercle (rarely with small spine); dorsal spines as in *C. spinipennis* but smaller and set further back (see table, p. 423 and Text-fig. 13); anterior and posterior spines × 0·5–1 and × 1·4–1·7 respectively as long as broad in male, × 0·5–0·8 and × 0·8–1·1 respectively in female (breadth measured at extreme base); all spines in female and anteriors in male tapering evenly to a point, posteriors in male sub-cylindrical in basal half, tapering apically; all spines distinctly reflexed posteriad; striae distinctly impressed; interstriae strongly raised opposite gaps between punctures, forming high undulating transverse folds as in *C. transversalis*; shoulder region with numerous round or somewhat irregular granules, sometimes strongly raised; scales dense but more or less confined to depressions, white or pearly but sometimes brown locally; setae distinct, hyaline or brownish.

Legs as in *C. spinipennis* but setae brown throughout and corbels filled with a dense mass of adventitious setae; claw-segment of tarsi × 0·8 as long as 2 + 3 in male, × 0·9 as long in female. *Underside* densely and fairly evenly squamose; setae white or brownish. *Aedeagus* similar to that of *C. spinipennis*, convex above (sometimes flattened in mid-line), convex to distinctly concave below; surface below phallotreme smooth or irregular, sides smooth or irregularly rugose, upper surface usually microreticulate towards base; apex rather long, fairly evenly tapering; tip rounded, flat, weakly deflexed. *Ovipositor* short, valves strongly depressed apically.

Holotype ♂, with ' Champion B.' and ' intermedius ' in BM(NH).

Paratype ♂, with ' Champion B.' (BM(NH)).

A total of 42 specimens has been seen.

Localities: North West Cape; ' Between Carnarvon Distr. and N.W. Cape '; Carnarvon. The first of these records is based upon a series of 36 exx. (21 ♂, 15 ♀) taken by A. M. Douglas on 25.vii.1963 (31 W, 5 BM(NH)), the second upon a very large female taken by D. G. Stead in 1929 (A) and the third upon a male taken by Dr. Uther Baker (FHUB). The published type-locality is probably false. Two further specimens are known, both determined by Pascoe, one from his supplementary collection and bearing a printed label: ' Champion Bay? ', the other from the Fry collection, with ' De Boulay ' and ' Swan R.' This last locality is certainly false (see under *C. echidna*, p. 430).

A distinctive species, not readily confused with any other. It also has the most northerly range. It is worth noting, however, that the two principal series available show slight but constant differences in sculpture, etc. the significance of which can only be assessed when more material becomes available.

Catasarcus albipectus sp. n.

(Text-figs. 14, 15, Map 4)

Length 7·2–13 mm. Prothorax very dark red (not obvious to unaided eye); head and rest of body, including elytral spines, black; legs and antennae dark to blackish red. Scales very sparse dorsally, dense ventrally, forming a brilliant white lateral stripe on thorax; yellow-brown powdery exudate present. *Head* as in *C. spinipennis* (vestiture excepted); median frontal carina always present but variable in size; eye × 1·4 as long as broad. *Rostrum* as in *C. spinipennis* (vestiture excepted). *Antennae* with lengths of funicle segments 1–3 in ratio 2·9 : 1·4 : 1 (mean of six); scape and funicle densely squamose. *Prothorax* transverse (10 : 14·7–16·7), broadest about middle; sides weakly rounded, weakly converging or subparallel posteriorly, more strongly converging anteriorly but not, or not strongly, constricted; post-ocular lobes distinct, with relatively long whitish vibrissae; transverse striae weak but complete or nearly so (posterior sometimes obsolete); dorsal surface uneven or obscurely granulate and finely rugose or micropunctate, often with scattered moderate punctures containing stout, conspicuous setae; sides distinctly granulate. *Scutellum* variably developed, punctate, sometimes squamose; scutellar area of mesonotum usually with pale elongate or filiform scales. *Elytra* ovate-acuminate (10 : 6·8–7·6); humeral tubercle absent or obsolete in male, moderate sharp basal and directed obliquely anteriad in female; post-humeral bulge very rarely with small spine, usually with small sharp tubercle but even this often obsolete in male; anterior dorsal spines (Text-figs. 14, 15) tapering evenly to a point in both sexes; posterior spines cylindrical and very long in male, subcylindrical or tapering and shorter in female, × 1·3–1·8 and × 1·9–3

(4 × mean diameter) as long as broad in male, × 0·7–1·2 and × 1·3–1·6 as long in female; striae impressed weakly in female (distinctly on declivity), not at all in male (except sometimes on declivity); disc even or with weak transverse folds in male, female with stronger folds and often with raised granules in shoulder region and at base of interstriae 2, 3 and 5; entire surface microgranulate or microrugose. *Legs* as in *C. spinipennis* (vestiture excepted) but claw-segment of tarsi shorter, × 0·7 as long as 2 + 3 in male, × 0·9 as long in female. *Venter* as in *C. spinipennis* (vestiture excepted).

Vestiture of dorsum in male very sparse, composed of small grey and larger yellowish scales scattered thinly over pronotum and elytra, on latter mostly confined to punctures especially below dorsal spines, denser and duller on declivity, denser larger and brighter towards costa where they flank the brilliant ventro-lateral stripe; head and rostrum with similar yellowish scales, very dense in and around transverse rostral furrow; setae large, white or yellowish, those on frons between eyes very long, semi-recumbent, directed posteriad; those on pronotum shorter, recumbent, mostly directed mesad; those on elytra very small, but distinct, white or brown. Underside of head with elongate pearly scales, imbricate below eye, becoming less dense mesally; prothorax below sides (but above coxae), greater part of mesepisternum, mesepimeron, metepisternum and adjacent part of metasternum all with a very compact covering of strongly imbricate very large oblong brilliant white scales (with pearly lustre), together forming a prominent white stripe; similar but less compact scales on intercoxal process of mesosternum and (narrowly) on costal margin of elytra (rarely also on interstria 8 above hind coxa in female); sides of mesosternum and adjacent part of mesepisternum bare smooth and shiny; prosternum, metasternum and venter with dense loose pearly scales, tinted by yellow-brown powdery exudate; setae white, semi-erect, large and conspicuous on venter; femora with similar large setae and numerous small round appressed hyaline or grey scales, often with a blue reflection; tibiae and tarsi with narrower, mostly brown setae and dense pale grey scales, convex and tessellate on tibiae towards apex. Vestiture of female denser and paler above; scales on tibiae and heads of femora tessellate or very dense throughout; otherwise as in male.

Aedeagus similar to that of *C. spinipennis*; flat or sulcate dorsally, strongly and evenly convex ventrally, smooth; apex variable, tip flat, rounded, weakly deflexed. *Ovipositor* with valves strongly depressed, explanate.

Holotype ♂. WESTERN AUSTRALIA: Murchison River, [19]49–1090, in the Western Australian Museum, Perth.

Paratypes. 6 ♂, 4 ♀, same locality, 49–1088, 49–1089, 49–1091 to 49–1098 (8 W, 2 BM(NH)); 5 ♂, same locality, ix.1954 (*F. H. Uther Baker*) (4 FHUB, 1 UW); 5 ♂, 2 ♀, ditto but ix.1956 (5 FHUB, 2 W); 1 ♀, ditto but 18.ix.1960 (FHUB); 9 ♂, 6 ♀, ditto but 21.ix.1960 (11 FHUB, 3 BM, 1V); 1 ♀, ditto but 29.ix.1960 (BM(NH)); 2 ♀, same locality, ix.1954 (*A. Douglas*); 2 ♂, ditto but ix.1956 (all W); 1 ♂, 1 ♀, '1½ m. N. Murchison Mouth', 66–414, 66–415 (*R. Humphries*) (W); 1 ♂, 1 ♀, Murchison River Reserve, 24.ix.1960 (*F. H. Uther Baker*) (FHUB); 1 ♂, Kalbarli [Kalbarri], 25.ix.1960 (*F. H. Uther Baker*) (FHUB); 1 ♂, without locality (Dresden); 1 ♂, 1 ♀, ditto, ex W. Tylden coll. (Oxford); 1 ♂, ditto, ex A. Fry coll. (30851) (BM(NH)). Total: 52 specimens.

Localities: Around the mouth of the Murchison River.

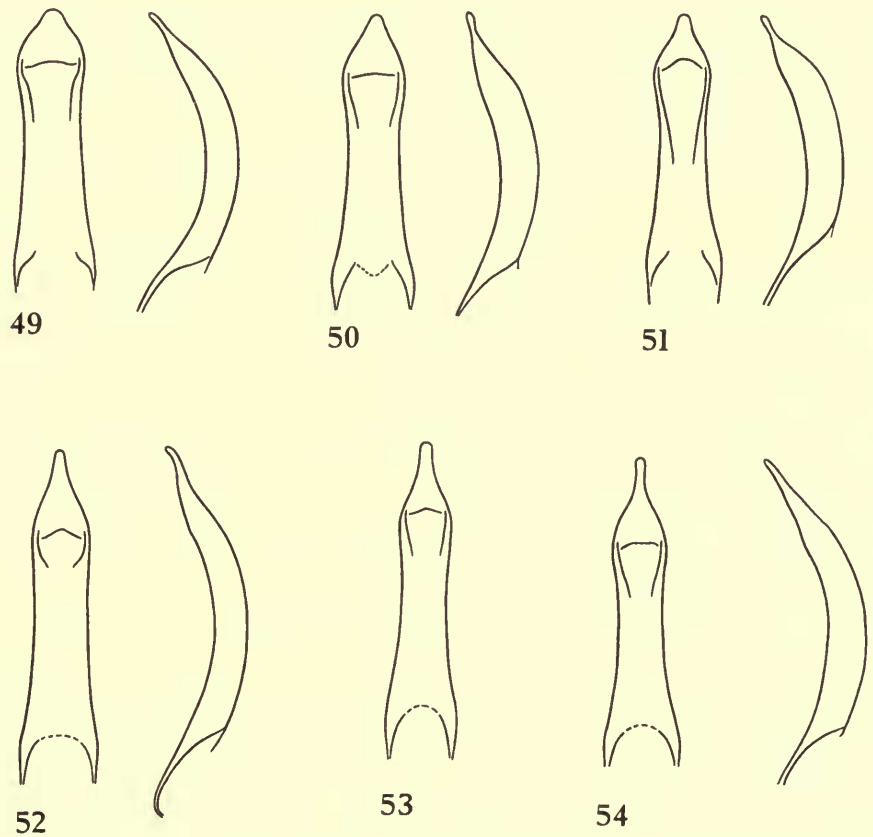
Host-plants: *Acacia rostellifera* (Murchison River, ix.1956 (*A. Douglas*) (W)).

Easily distinguished from all other quadrispinate species (except the following) by the red pronotum and the very long, cylindrical, posterior dorsal spines of the male, which are combined with an extreme reduction of the post-humeral spine. The overall sex ratio shows a predominance of males by 33 : 19 (1·74 : 1).

Catasarcus bicolor sp. n.

(Map 4)

Length 7·8–8·5 mm. Pronotum, antennae and legs dark red; head and rest of body, including elytral spines, black. Scales generally sparse dorsally (except on head) but elytra with small white lateral flash and other markings; dense ventrally and with white ventro-lateral stripe as in *C. albipectus*; yellow-brown powdery exudate present. *Head* and *rostrum* as in *C. albipectus* (frons sometimes quite flat). *Antennae* with lengths of funicle segments 1–3 in ratio 3·2 : 1·5 : 1 (mean of four). *Prothorax* transverse (10 : 16·5–17·3), broadest behind middle; sides weakly to moderately rounded, converging anteriorly, with moderate anterior constriction; transverse striae usually deeply impressed and complete; disc of dorsal surface asquamose, with scattered punctures containing small setae, obscurely granulate or microrugose in mid-line and along hind margin, elsewhere uneven but smooth and shiny; sides with ill-defined granules and large whitish scales, sometimes dense; tract of imbricate white scales above coxa as in *C. albipectus* but less compact. *Scutellum* as in *C. albipectus*. *Elytra* globose-acuminate (10 : 7·4–8);



FIGS. 49–54. *Catasarcus* spp. Aedeagus in dorsal and lateral view. 49, *C. memnonius* Pascoe. 50, *C. albisparsus* Pascoe (holotype). 51, *C. marginispinis* Pascoe (holotype). 52, *C. spinipennis* Fåhraeus. 53, *C. echidna* Pascoe (dorsal view only). 54, *C. concretus* Pascoe.

humeral tubercle and surface sculpture as in *C. albipectus*; post-humeral spine normal in both sexes (about as large as in *C. spinipennis*, etc.); dorsal spines all more or less tapering to a point, more elongate in male (× 1–1·4 and × 1·7–2·2 as long as broad) than in female (× 0·7 and × 1·1 as long as broad); anterior spines in female strongly divergent and close to posterior spines, as in female of *C. marginispinis*; both sexes have small bright and very small dull scales scattered throughout, with much larger pearly white scales forming a broad lanceolate patch covering base of post-humeral spine (above and behind) and extending posteriorly to level of hind coxa; similar scales on interstria 3 extend on to base of anterior dorsal spine (as in *C. marginispinis*); patches of similar but smaller scales occur around scutellum and on declivity below dorsal spines. *Legs* as in *C. albipectus* but claw-segment of tarsi slightly longer (= 2 + 3 in female, × 0·75 as long in male). *Underside* similar to that of *C. albipectus*. *Aedeagus* stouter and more strongly curved than in *C. albipectus*; deeply sulcate dorsally; convex below; either smooth throughout or apical region microgranulate and with a few coarse wrinkles below phallotreme; sides microrugose; upper surface microreticulate, especially towards base.

Holotype ♂. WESTERN AUSTRALIA: Lynton, 17.ix.1958 (*F. H. Uther Baker*), in the Western Australian Museum, Perth.

Paratypes. 1 ♀. same data as holotype (FHUB); 1 ♂, Northampton, 17.ix.1958 (*F. H. Uther Baker*) (BM(NH)); 1 ♂, Ajana, ix.1956 (*A. Douglas*) (W).

Very closely related to the preceding species.

Catasarcus echidna Pascoe

(Text-figs. 16, 53, Map 4)

Catasarcus echidna Pascoe, 1870 : 16, 28.
Catasarcus bellicosus Pascoe, 1870 : 16, 28, **syn. n.**
Catasarcus araneus Pascoe, 1870 : 16, 29, **syn. n.**
Catasarcus humerosus Pascoe, 1870 : 17, 30, **syn. n.**
Catasarcus funereus Pascoe, 1870 : 17, 31, **syn. n.**
Catasarcus brevicollis Pascoe, 1870 : 17, 32, **syn. n.**
Catasarcus scordalus Pascoe, 1870 : 17, 37, **syn. n.**
Catasarcus bellicosus Pascoe; Lea, 1897 : 596.
Catasarcus echidna Pascoe; Lea, 1897 : 596.
Catasarcus araneus Pascoe; Lea, 1897 : 597.
Catasarcus humerosus Pascoe; Lea, 1897 : 597.
Catasarcus funereus Pascoe; Lea, 1897 : 597.
Catasarcus brevicollis Pascoe; Lea, 1897 : 597.
Catasarcus scordalis [*sic*] Pascoe; Lea, 1897 : 599.

Length 6·9–11·3 mm. Body, including elytral spines black; legs and antennae dark red (dorsal elytral spines sometimes red but then darker than legs). Scales dense, fairly uniform, unicolorous pearly or greenish white tinted with yellow-brown powdery exudate. *Head* and *rostrum* as in *C. spinipennis* but lateral frontal carinae more distinct, usually forming a sharp strongly curved edge to frons; median rostral carina sometimes tectiform and often raised, especially posteriorly. *Antennae* with lengths of funicle segments 1–3 in ratio 2·8 : 1·4 : 1 (mean of eight); scales mostly bronzy, dense. *Prothorax* of unusually variable proportions (10 : 16·7–19·5), the variation not related to sex; broadest about middle; sides weakly rounded, subparallel or weakly converging anteriorly; dorsal surface sometimes as in *C. spinipennis* but often more strongly granulate and transverse striae more deeply impressed. *Scutellum*

as in *C. spinipennis*. *Elytra* ovate-acuminate (10 : 6·8–7·5); humeral tubercle variable, sometimes large sharp and directed obliquely anteriad, sometimes obsolete; post-humeral spine as in *C. spinipennis*; striae seldom clearly impressed; strial punctures large; disc with irregular transverse folds; shoulders with round granules, strongly raised and sharp in some females, obsolete in some males; base of interstria 3 almost always with either a large, usually sharp, strongly raised granule or a lower, smoothly rounded, shiny callus which may encroach upon adjacent interstriae; much smaller granule at base of interstria 5 and sometimes 2; anterior dorsal spines of male plainly nearer base of elytra than in other species (see above, p. 423 and Text-fig. 16); posterior spines larger in male than in female ($\times < 2{\cdot}5$ as long as broad); both spines weakly recurved posteriad in both sexes; interstria 3 sometimes raised as in some *C. spinipennis*. *Legs* similar to those of *C. nephelodes* (including vestiture).

Vestiture composed of large, pale and very small, colourless scales (intermediate-size bronzy scales sometimes present, especially on declivity). Large scales cover frons (except in mid-line) extending posteriorly to well beyond level of hind margins of eyes, dorsal area of rostrum (at least to level of insertion of antennae), underside of rostrum and head (dense below eye); on prothorax they occur mainly at sides, in anterior constriction (which is often deep) and along mid-line; density on elytra varies but they are usually very dense or imbricate around scutellum, behind dorsal spines and below post-humeral spine. Elytral spines bare or with very small dull scales only. Underside generally densely squamose but large discal areas of ventrites 1–4 bare or with scattered very small colourless scales; ventrite 5 with large scales confined to base and sometimes only at sides. Setae white or hyaline but becoming brown towards apex of elytra.

Aedeagus (Text-fig. 53) flat or weakly sulcate dorsally, moderately to strongly convex and smooth ventrally; apex narrow, elongate, parallel-sided, tip deflexed. *Ovipositor* with valves distinctly depressed but less strongly so than in *C. nephelodes*.

The following specimens are in BM(NH):

Holotype of *echidna*, ♂, with ' Champion B.' and 'Catasarcus/echidna/*type* Pasc.' Unique. A further male specimen from Pascoe's main collection, determined by him, has black dorsal spines, not red as in the holotype.

Holotype of *bellicosus*, ♂, with ' West/Australia ' and ' Catasarcus/bellicosus/*type* Pasc.' Not unique (' I have several specimens ') but I have been unable to recognize any paratypes with certainty. There is a male specimen, without locality, in Pascoe's supplementary collection determined by him as this species. There is also a small abraded male of *C. spinipennis* from the Fry collection with ' TYPE '; ' De Boulay '; ' Nov. Holl./Swan R.' and ' bellicosus Pasc.', the last in Pascoe's hand.

Holotype of *araneus*, ♂, with ' Champion B.' and ' araneus '. Paratype ♂, with ' TYPE '; ' 38239 '; ' Nov. Holl./Champion B.'; ' Fry Coll./1905.100 ' and ' Catasarcus/aranius [*sic*]/Pasc./Champion B.', the last in Pascoe's hand. (This is one of eight specimens of Coleoptera, Nos. 38237–38244, acquired by Fry from Pascoe very early in 1870 (previous page of register is dated 21.i.1870) and almost certainly before the publication of Pascoe's paper (March). These are the only specimens of Pascoe's species outside his own collection which have a definite claim to type-status).

LECTOTYPE of *humerosus*, ♀, with ' West Australia ' and ' humerosus ', the latter in Marshall's hand.

Paralectotypes: 2 ♀, with ' Champ. Bay ' (white rectangular label), one also with ' humerosus ' in Marshall's hand. There can be little doubt that the lectotype is one

of the (several) specimens upon which Pascoe's description was based. The status of the paralectotypes is less clear; the locality is not mentioned by Pascoe but they fit the description and Marshall's label suggests that they were in Pascoe's series of this species. There is a female from Pascoe's supplementary collection with ' Catasarcus/humerosus/Pasc./Champ. B.' in his hand and another from the Fry collection with ' 37860 '; ' De Boulay '; ' Nov. Holl./Swan R.' and ' humerosus/Pasc.', the last in Pascoe's hand.

Holotype of *funereus*, ♀, with ' Champion B.' and ' Catasarcus/funereus/*type* Pasc.' Paratype ♀, with ' TYPE '; ' 38238 '; ' Nov. Holl./Champion B.'; ' Fry Coll./1905.100 ' and ' C. funereus/Pasc./Champion Bay ', the last in Pascoe's hand (see note under *araneus* above). There is also a female from Pascoe's main collection with ' funebris/Pasc.' in Marshall's hand.

Holotype of *brevicollis*, ♀, with ' Champion B.' and ' brevicollis '. Apparently unique.

Holotype of *scordalus*, ♀, with ' Champion B.' and ' Catasarcus/scordalus/*type* Pasc.' Apparently unique. There is a similar female from Pascoe's main collection, without locality, with ' scordalus/? ' in Marshall's hand. The incorrect spelling used by Lea occurs also in Masters' catalogue (1871).

A total of 89 specimens has been seen.

Localities: Geraldton; Dongara; Eradu; Morawa. A number of specimens of this (and other) species, especially in the Fry collection, bear the locality name ' Swan River '. This is believed to be an error. The collector is given as ' De Boulay ' (= F. H. du Boulay) who collected mainly around Geraldton (Musgrave 1932 : 72). Records for Newcastle, N.S.W. (Frey) and Queensland (BM(NH), V) are obviously false.

From his key, it is clear that Pascoe regarded the sexes of this species as distinct species-groups, the male comprising three species, the female four. Of the males, it is true that in *C. araneus* the lateral frontal carinae are reduced, as in typical *C. spinipennis* but this is characteristic of most small specimens of this species. Pascoe distinguishes *C. echidna* from *C. bellicosus* on the width of the head and rostrum but measurement shows that this difference is largely illusory; the lack of scales noted in *C. bellicosus* is merely the result of abrasion. It is worth noting, however, that the holotype of *C. echidna* is somewhat teneral and the dorsal elytral spines are dark red, whereas in *C. bellicosus* they are black. Of the females, the description of *C. scordalus* is based on a specimen in which the tips of the post-humeral spines have been broken off, reducing each to ' a mere tubercle ', while a prominent median frontal elevation accounts for the ' five short but very distinct carinae ' on the head; the dorsal elytral spines are, however, unusually slender, resembling those of the male (but in the female location). The types of *C. funereus* are simply abraded and nothing more need be said about them except that the specimen which Pascoe retained and labelled as the holotype is strongly bleached dorsally and thus fits the description less well than the specimen he passed to Fry, which is not at all bleached. The prothorax of *C. brevicollis* is not, in fact, ' more than twice as broad as long ' but

only × 1·93 as broad; it is made to appear broader by a transverse tract of whitish scales which extends from one side to the other. The proportions of the prothorax in this species are, however, unusually variable. The specimens of *C. humerosus* are all normal; the lectotype is severely abraded.

As stated below (p. 435), Lea's observations were based solely on Pascoe's descriptions and do not merit detailed consideration.

Males of this species are easily distinguished from those of *C. spinipennis* and *C. nephelodes* by the position of the anterior dorsal spines (see above, p. 423) and the callus at the base of interstria 3. Females can usually be separated from *C. spinipennis* by the anterior spine index and from *C. nephelodes* by the callus (and other granules) on the elytra. It should also be noted that the dorsal elytral spines are usually quite black in this species but only rarely so in the others.

Catasarcus nephelodes sp. n.

(Map 4)

Catasarcus spinipennis Fåhraeus; Pascoe, 1870 : 17, 32.

Length 7·7–11 mm. Body, including post-humeral spines, black; legs, antennae and dorsal spines red or dark red. Elytra commonly with a series of pale patches on a dark background; pale scales usually with strong coppery or rosy reflection; powdery exudate seldom present. *Head* and *rostrum* as in *C. spinipennis* (vestiture excepted) but epistome often flat and chin more pronounced. *Antennae* with lengths of funicle segments 1–3 in ratio 3 : 1·6 : 1 (mean of five); scape and funicle covered with large ovate or oblong scales, mostly pearly or otherwise metallic but those on basal two-thirds of scape usually bronzy. *Prothorax* with ratio of dimensions 10 : 16·7–17·8, broadest at or near base; sides moderately rounded; dorsal surface fairly smooth; both transverse striae well developed and complete or nearly so; distinct granules at sides but often obscured by scales. *Scutellum* very small with punctures and filiform scales. *Elytra* ovate-acuminate (10 : 7–7·5); costa strongly sinuous, as in *C. spinipennis*; apex weakly mucronate; humeral tubercle small and sharp or obsolete; post-humeral spine as in *C. spinipennis*; anterior dorsal spine sometimes no longer than (at extreme base) broad; posterior spine up to twice as long as broad, or more; when long, usually somewhat reflexed posteriad; striae scarcely impressed on disc; interspaces weakly convex, with some tendency to form weak transverse folds (especially in female) but without any granules. *Legs* as in *C. spinipennis* (vestiture excepted). *Venter* almost smooth in female; ventrites 1 and 2 in male with scattered granules which are denser and bead-like at sides of ventrite 1.

Vestiture dorsally composed typically of small dark bronzy or reddish bronze scales with a series of patches of much larger, paler scales which are usually pearly but often tinged with golden yellow by traces of powdery exudate, especially on head. Large scales occupy base of dorsal area of rostrum, frons, including admedian carinae (especially large at level of hind margins of eyes), underside of head (imbricate below eye) and underside of rostrum; on prothorax they form a stripe of variable width near sides and a narrow median stripe, either of which may be ill-defined or obsolete; on elytra they always occupy base of interstria 1 and sometimes extend along it, sparsely, to declivity; small humeral patch present, also larger triangular patch on area in front of anterior spine between striae 3 and 4; size of this pre-spinal patch is related to size of area, which is sometimes very small and patch absent (especially in Hill River specimens); sometimes pre-spinal patch is linked to humeral patch by tract of scales along interstria 6; scales on declivity sometimes almost entirely of small dark type and very dense but more often with sprinkling of pale scales which are condensed in strial punctures and on an ill-defined area

behind anterior spine; sides of elytra below and (for a short distance) behind post-humeral spine with very large imbricate scales (these and those on adjacent parts of thorax are sometimes white, contrasting strongly with dull upperside). Underside densely squamose. Setae on head and rostrum white; on prothorax white and brown; on elytra smaller, dark brown and very inconspicuous; on thoracic sterna and ventrites 1 and 2 white; on ventrites 3–5 brown. Femora typically with small round appressed separate scales, coppery or greenish, with a glowing blue or violet reflection; heads of femora with mostly similar but denser scales; dorsal surface of hind (sometimes all) femora often with larger, pink scales without reflection; scales on tibiae pale ventrally, bronzy dorsally; those on tarsi bronzy, often with strong green reflection and sometimes with pearly scales intermixed, especially on claw-segment; setae on shafts of femora long and white or hyaline; elsewhere blackish brown.

Aedeagus sulcate dorsally, weakly convex or flat in middle of length ventrally, becoming quite flat or somewhat concave below phallotreme; surface here with transverse wrinkles, variable in extent but always present; sides and sometimes entire dorsal surface, microreticulate or microrugose; apex about as in *C. spinipennis*. *Ovipositor* with valves strongly depressed apically, together distinctly broader than high.

Holotype ♂. WESTERN AUSTRALIA: Perth, Mount Yokine, 26.i.1957 (*I. M*[*urray*]), in the National Museum of Victoria, Melbourne.

Paratypes. 5 ♂, 2 ♀, same data as holotype (6 V, 1 BM(NH)); 1 ♂, ditto but 15.xii.1956; 1 ♀, ditto but 26.iii.1957 (both V); 3 ♂, 2 ♀, ditto but 27.i.1958 (4 V, 1 BM(NH)); 1 ♂, Perth, i.1961; 1 ♂, Bullsbrook, 29.xii.1947 (*A. D*[*ouglas*]) (both V); 6 ♂, 5 ♀, Hill River district, 8.xii.1962 (*F. H. Uther Baker*) (7 FHUB, 4 BM(NH)); 2 ♀, Swan River, [18]43–14 [' Presented by Dr. Richardson ']; 1 ♂, same locality, [18]43–28 [' Bought of Turner '] (all BM(NH)); 1 ♂, same locality (*Kirsch*) (Dresden); 1 ♀, same locality (*Hope*), incorrectly labelled as holotype (' Typus ') of *C. spinipennis* (Stockholm); 2 ♀, same locality (' SR ') (*Baly*), 1 ♂, same locality (' Sw. R '), 439, all ex Bowring coll. (all BM(NH)); 1 ♂, same locality, 37861, ex Fry coll.; 1 ♀, same locality, ex Pascoe coll. (both BM(NH)); 1 ♀, same locality (*J. S. Clark*) (V); 1 ♀, Champion Bay (printed label) and ' C. capito/var.?/Champ.' (in Pascoe's hand); 1 ♂, with ' C. nitidulus/var.?/Champ.' (in Pascoe's hand), both ex Pascoe coll. (BM(NH)); 1 ♂, ' New Holland ', [18]44–4 [' Collected by [B.] Bynoe Esq. Surgeon R.N.'] (BM(NH)); 1 ♀, with ' Austral ' and ' Erwerb 1955/Coll. Brancsik ' (Frey); 2 ♀, with ' Coll. Baden-/Sommer./ex V. d. Poll./Pres. 1911, E./B. Poulton ' (Oxford); 2 ♂, 1 ♀, Adelaide; 1 ♂, ' N. Holld.', 1 ♂, without data, all ex Hope coll. (all Oxford); 2 ♂, 1 ♀, without localities, ex Howitt coll.; 1 ♀, without data (all V); 1 ♂, ditto, ex Marshall coll.; 1 ♀, ditto, ex Sharp coll. (both BM(NH)). Total: 56 specimens. About 15 further specimens have been seen; these were returned to their owners determined as *C. spinipennis* before the mis-labelling of the holotype of that species was noted. Similarly, many specimens of *C. spinipennis* were returned determined as *C. ericius* (a synonym of *C. spinipennis*).

Localities: Mount Yokine (4 miles north of Perth); Bullsbrook; Hill River. The record for Adelaide is obviously false.

This species exhibits less variation in scale size than does *C. spinipennis*. The pre-spinal patches, to which (with others) the name refers, are not always present or distinct and are sometimes evident in related species; they are, nevertheless, most characteristic of this species.

Catasarcus albuminosus Pascoe

Catasarcus albuminosus Pascoe, 1870 : 16, 29.
Catasarcus albuminosus Pascoe; Lea, 1897 : 597.

Pascoe's description was based upon a single, almost totally abraded and severely bleached specimen. He later associated with it a second specimen in similar condition which happens to be conspecific with the first. Externally, allowing for the lack of scales, these specimens, both male, agree closely with some *C. echidna* except that they lack any definite callus at base of interstria 3; their anterior spine indices (37 and 39) are possible for *C. echidna* and much too low for anything else. The aedeagus, however, is wrinkled below in both specimens, more extensively so than in *C. nephelodes*, the only closely related species having this character. It seems best, therefore, to maintain this species as valid but to await further material before attempting a formal description.

Holotype ♂, with ' Champion B.' and ' Catasarcus/albuminosus/*type* Pasc.' in BM(NH). Unique (' $3\frac{3}{4}$ lines '). A larger specimen from Pascoe's main collection, without locality, is labelled ' albuminosus ' in his hand.

A third male specimen, agreeing closely in structure and condition with the others and with spine index 39·6, is in the W. Tylden collection (Oxford).

Catasarcus spinipennis Fåhraeus

(Text-figs. 1, 17, 52, Map 4)

Catasarcus spinipennis Fåhraeus in Schönherr, 1840 : 817.
Catasarcus spinipennis Schönherr; Labram and Imhoff, 1848, No. 27; fig.
Catasarcus spiniferus Lacordaire, 1863 : 249 [? error for *spinipennis*].
Catasarcus nitidulus Pascoe, 1870 : 17, 30, **syn. n.**
Catasarcus ericius Pascoe, 1870 : 17, 37, **syn. n.**
Catasarcus spinipennis Fåhraeus; Lea, 1897 : 591, 595.
Catasarcus nitidulus Pascoe; Lea, 1897 : 596.
Catasarcus ericius Pascoe; Lea, 1897 : 599.
Catasarcus spinipennis Fåhraeus; Lea, 1909*b* : 216.
Catasarcus spinipennis Fåhraeus; Tillyard, 1926 : 242; pl. 19, fig. 18.

Length 7·1–12·4 mm. Body, including post-humeral spines, black; antennae, legs and dorsal elytral spines red, dark red, or almost black. Scales mainly pinkish white; scanty yellow-brown powdery exudate present. *Head* with frons broad (almost double long axis of eye), flat and smooth; frontal carinae short, sometimes obscured by scales, both pairs strongly converging anteriorly; axis of lateral carina in line with centre of eye; smooth slender tectiform carinula present in mid-line, usually extending from near transverse furrow to level of centre of eyes (but often obsolete); eyes moderately convex and about × 1·3 as long as broad. *Rostrum* × 1·2–1·4 (♂), × 1–1·3 (♀) as long as broad, progressively widening apically; epistome triangular, disc broadly depressed; median carina narrow, sharp, level, weakly projecting over the deep transverse furrow; oblique basal sulci (with concomitant carinae anteriorly) distinct. *Antennae* with lengths of funicle segments 1–3 in ratio 2·8 : 1·5 : 1 (mean of ten); remaining segments longer than broad; club fusiform. *Prothorax* transverse (10 : 17–18·9), broadest about middle; sides weakly to moderately rounded; post-ocular lobes small, angular, with relatively long white vibrissae; transverse striae complete or nearly so, usually strongly impressed; mid-line

from anterior transverse stria to base with more or less irregular linear impression; disc smooth, uneven or obscurely granulate; sides distinctly to strongly granulate. *Scutellum* small, densely punctured, with elongate and filiform scales. *Elytra* ovate-acuminate (10 : 6·7–7·5); humeral tubercle varying from large to obsolete; post-humeral spine usually large, narrow and sharp, with axes of spines on each elytron coincident but tip often strongly reflexed posteriad (possibly a mechanical effect while in teneral state); spine sometimes much smaller, resembling sharp tubercle of some non-spiny species; each elytron (Text-figs. 1, 17) with a large elongate strongly tapering pointed spine in interstria 2 at top of declivity and a similar but shorter spine in interstria 3, anterior to first; bases of spines separated only by punctures of stria 2; axes of spines about at right angles to bases (seen from behind), hence divergent; spines larger, on average, in male than in female; anterior spines sometimes very small and shorter than broad at extreme base (very rarely obsolete); posterior spines larger, rapidly and evenly tapering when $<$ × 1·4 as long as broad but subcylindrical and more strongly curving posteriad when longer ($<$ × 2·2 as long as broad), the curvature often apparently accentuated mechanically in teneral state; elytral interspaces sometimes fairly uniformly raised, forming a smooth reticulum with weak transverse folds but usually with strong transverse folds over disc and numerous raised granules in shoulder region (granules sharp in some large females); interstria 3 from base to anterior dorsal spine often slightly higher than 2 and 4 (elevation revealed by selective abrasion) and often with large granule at base, as in *C. echidna* but here with series of similar granules throughout basal portion. *Legs* with femora moderately swollen; tibial teeth small; corbels large, with about 5–15 adventitious setae; segments 2 + 3 of hind tarsus about as long as claw-segment in ♀, longer in ♂. *Venter* without post-coxal cavities; ventrites 1 and 2 with shiny bead-like granules, numerous and prominent in male, scattered and inconspicuous in female.

Vestiture exceedingly variable. In one extreme form, from Carnac Island, all scales are very large, round, loose, whitish, with weak coppery reflection (stronger on legs), somewhat condensed along suture, before and, more especially, behind dorsal spines, covering latter partially and post-humeral spines almost entirely (cf. *C. nephelodes*); at most a few bronzy scales on disc of pronotum, near apex of elytra, on dorsal edge of hind tibiae and sprinkled on tarsi. A very similar form from Rottnest Island has small appressed coppery or metallic green scales on heads of femora. Specimens from Garden Island and various mainland localities show a progressive reduction in size of scales on femora, parts of elytra and prothorax. The most extreme examples, mainly from the Fremantle area, resemble *C. nephelodes* except that their scales are all pearly, coppery or greenish white (including those on tarsi). Setae on tarsi blackish brown; elsewhere on body and legs white or hyaline (long and rather conspicuous on femora).

Aedeagus (Text-fig. 52) flat dorsally (surface often uneven), weakly to very strongly concave ventrally; never with any transverse wrinkles below phallotreme; apical region short, tip sharp, not swollen, weakly deflexed. *Ovipositor* with valves compressed but no higher than together broad.

Holotype of *spinipennis*, ♂, with '*Polydius? spi*/*nipennis* Hop/Swan Rivier/ N. Holl. Hope' and 'Paratypus' in Naturhistoriska Riksmuseum, Stockholm. Unique.

From the determination label and the fact that it agrees closely with the description, I am convinced that this is the specimen which Fåhraeus described, not that of *C. nephelodes* which has been incorrectly labelled as the holotype.

The following specimens are in BM(NH):

Holotype of *nitidulus*, ♀, with 'Swan River' and 'Catasarcus/nitidulus/*type* Pasc.' Unique.

Holotype of *ericius*, ♂, with 'Swan Riv.' and 'Catasarcus/ericius/*type* Pasc.' Unique.

Some 300 specimens seen.

Localities: Perth area; Moore River; Bejoording; Darlington; Lake Jandakot; Carnac Island; Rottnest Island; Garden Island; Naval Base; Medina; Kwinana; Cape Peron; Safety Bay; Jarrahdale; Peel Estate; Buckland Hill (near Collie); Bunbury; Busselton; Cape Naturaliste; Quindalup; Yallingup; Pemberton. Two specimens in F.E. Wilson's collection labelled ' Wialki W. A./Sep. 51/Dr. Uther Baker ' are thought to be wrongly labelled; Dr. Baker informs me that he has no specimens from this locality in his own collection. False records have been seen for Kiata, V. (V); Mount Canabolas, N.S.W. (A); Melbourne (Dresden) and Brazil (BM(NH)).

Pascoe, having misidentified an undescribed species as *C. spinipennis*, described the two sexes of the latter as new. The scutellum of the holotype of *C. nitidulus* appears to be ' larger than usual ' because the prothorax has moved forward, exposing the entire scutellar area of the mesonotum, from which the scutellum proper is not clearly differentiated.

As stated earlier (p. 423), Lea was grievously mistaken in thinking that all the seventeen quadrispinate species described by Pascoe were synonyms of *C. spinipennis*. He based this view upon his inability to distinguish more than one species in the field and upon a study of the descriptions; he did not see the types.

This species exhibits wide variation in the proportion of large pale scales present. Specimens from the off-shore islands have most large scales but those from some mainland localities are very similar.

Catasarcus concretus Pascoe

(Text-figs. 18, 54, Map 4)

Catasarcus concretus Pascoe, 1870 : 17, 38.

Length 7·2–9·6 mm. Body, including elytral spines, black; legs and antennae dark red. Scales fairly dense, mainly pearly, not forming a definite pattern. *Head* as in *C. marginispinis* but eyes smaller, more strongly convex and less elongate (× 1·3 as long as broad). *Rostrum* as in *C. marginispinis* but genae less strongly widening apically (on average), hence only × 1·2–1·3 as long as broad. *Antennae* with lengths of funicle segments 1–3 in ratio 2·6 : 1·4 : 1 (mean of four); densely squamose throughout. *Prothorax* as in *C. marginispinis* but sides more strongly rounded and broadest in basal half; post-ocular lobes obsolete (vibrissae normal); basal marginal stria distinct and complete; dorsal surface with disc uneven and with large irregular granules at sides. *Scutellum* exactly as in *C. marginispinis*. *Elytra* as in *C. marginispinis* but with accessory anterior spine present in interstria 4, directly in front of anterior dorsal spine, × 0·7 (♂) (Text-fig. 18), × 0·6 (♀) as long as broad, strongly reflexed posteriad in female; posterior spines sited higher on declivity than in all other species, so that axes of all four major spines lie in same plane; disc more strongly tuberculate than in *C. marginispinis* and sometimes with one or two tubercles on declivity on interstriae 3 and 5. *Legs* as in *C. marginispinis* but tarsi larger and broader (especially segment 2).

Vestiture variable; mainly whitish, variegated or sprinkled with dark or coppery scales (including area below eye); prothorax as in *C. marginispinis* but pattern broken up at sides by bare interstices between granules; femora with mostly pearly or coppery scales, tibiae and tarsi mostly bronzy; venter variegated; setae brown throughout.

Aedeagus (Text-fig. 54) depressed in mid-line above, broadly concave below, scarcely widening at phallotreme; sides and dorsal surface (except in mid-line) transversely microrugose; area below phallotreme flat and confusedly microrugose; apex elongate and very narrow, very weakly

spatulate, almost straight in profile view. *Ovipositor* with valves compressed but slender apically, together somewhat broader than high.

Holotype ♀, with ' Queensland ' and ' Catasarcus/concretus/*type* Pasc.' in BM(NH). Unique.

Localities: Hopetoun. The published type-locality is clearly false and a small abraded male from the Masters collection (Macleay) with ' Swan R.' must be wrongly labelled. This species was taken at Hopetoun by Dr. F. H. Uther Baker on 13.x.1950 (1 ♀) and 20.ix.1965 (3 ♂). The only other specimen known to me is an abraded female from the Bovie collection (Washington) labelled ' Australie Lea '.

Seven specimens seen.

The only species with six dorsal elytral spines. Apart from the third pair of spines and the more strongly convex eyes, this species closely resembles the more uniformly coloured forms of the following species. It is astonishing, therefore, to find that in *C. concretus* the valves of the ovipositor, although strongly tapered in profile view, are apposed and subcylindrical, whereas in *C. marginispinis* they are strongly explanate, flattened and blade-like.

Pascoe's tentative suggestion (p. 38) that specimens with six dorsal elytral spines may be the females of species in which the male has an additional, pre-basal, pair of spines is certainly mistaken. Although his specimen of *C. concretus* is, as it happens, female, the male also has only six spines. In both sexes, however, there is a single or double, rounded or sharp tubercle near the base of interstria 5, where the pre-basal spine occurs in *C. lepidus*. Both sexes of the latter have eight spines. (*C. lepidus* was the only octospinate species known to Pascoe; his last four descriptions all apply to this species). I have been unable to recognize the Fry specimen to which Pascoe refers (p. 38, note) as ' evidently belonging to one of the species in this section [but] which is without the basal spines '. There is a Fry specimen of *C. carbo* which may be the specimen in question; these species are very similar in appearance and Pascoe could have failed to notice that this specimen has only four post-median spines.

Catasarcus marginispinis Pascoe

(Text-figs. 51, 56, 57, Map 4)

Catasarcus marginispinis Pascoe, 1870 : 17, 32.
Catasarcus marginispinis Pascoe; Lea, 1897 : 597.

Length 6·5–10·3 mm. Body, including elytral spines, black; legs and antennae dark to blackish red. Scales forming a fairly constant pattern of pale markings on a darker ground, ranging from brilliant white on black to pale grey on golden brown or dark grey; brown powdery exudate sometimes present. *Head* with lateral frontal carinae entirely absent, frons falling away steeply and evenly from the greatly reduced admedian carinae; median frontal sulcus usually short but sometimes extends shallowly (rarely deeply) between eyes; centre and sides of frons either smooth or with longitudinal striations; eyes weakly convex, × 1·5 as long as broad. *Rostrum* × 1·1 as long as broad, genae strongly widening apically; epistome well defined, disc depressed, with two adherent flanking setae on each side; median carina moderately to strongly

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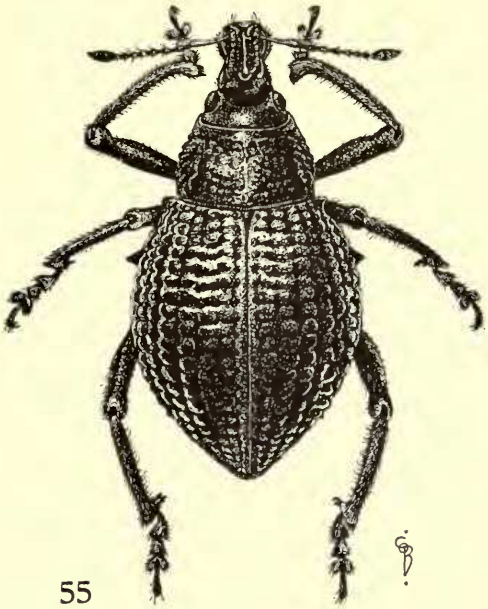
FIGS. 55–58. 55, *Catasarcus memnonius* Pascoe ♂. 56, *C. marginispinis* Pascoe ♀ (Wattening). 57, *Idem* ♂ (Tammin). 58, *C. albisparsus* Pascoe ♀.



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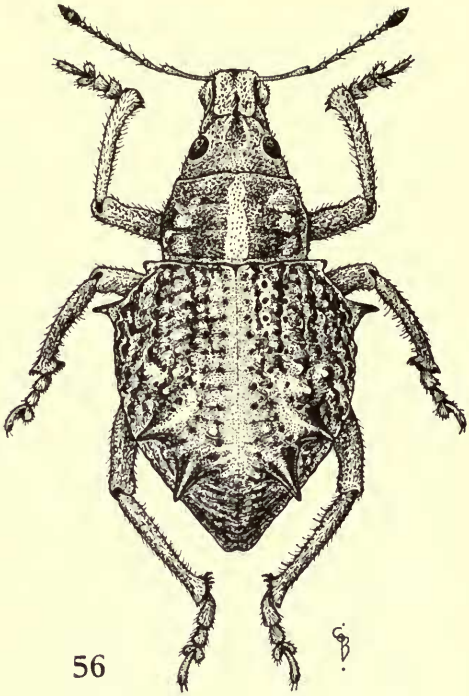

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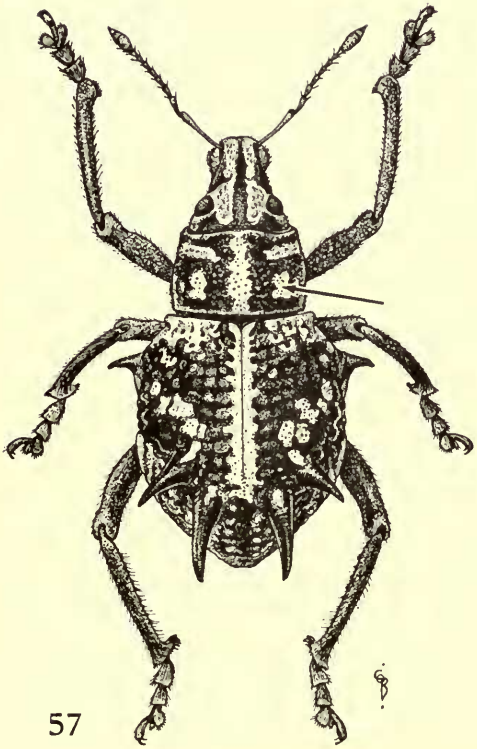

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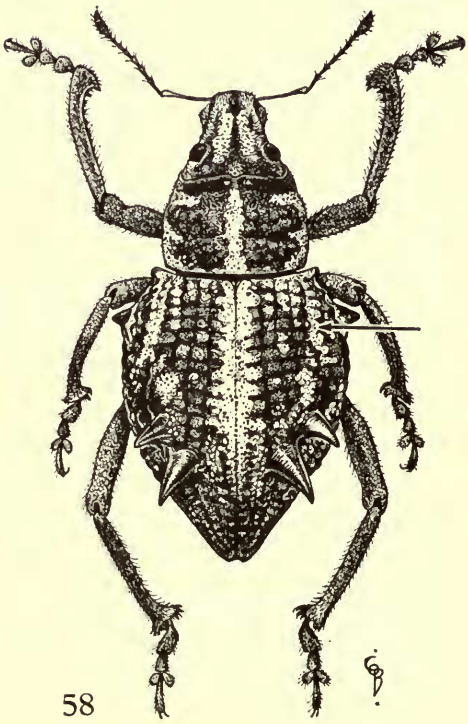

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raised at base, distinctly higher than frons and usually more or less parallel with latter in profile view. *Antennae* with lengths of funicle segments 1–3 in ratio 2·5 : 1·4 : 1 (mean of eleven). *Prothorax* of variable proportions (10 : 15·6–19), sides weakly to moderately rounded, often subparallel in basal half, distinctly converging anteriorly; post-ocular lobes evenly rounded, vibrissae subequal; posterior transverse stria strongly impressed (except in mid-line), anterior less so, often irregular and confused with strong anterior constriction; dorsal surface obscurely to distinctly granulate, more strongly so at sides. *Scutellum* scarcely developed; scutellar area of mesonotum with a number of vividly metallic iridescent scales. *Elytra* globose-acuminate (10 : 7·2–8); humeral tubercle basal or pre-basal, large and sharp or small or obsolete; a small round shiny forwardly-directed tubercle present at base of interstria 2 (nearly always), and 3 (usually), with sometimes a smaller scale-covered tubercle at base of interstria 5 (development of these tubercles sometimes differs on elytra of same specimen); post-humeral spine as large as in *C. spinipennis* or larger, axis often inclined anteriad but tip deflexed posteriad; dorsal spines about as broad at base as in *C. spinipennis* but less elongate: anterior × 1, posterior × 1·3 as long as broad in male, × 0·6 and × 1 as long in female; disc (except interstria 1) usually with undulating transverse folds and sometimes with raised granules (especially on interstria 5) but sometimes without either; often with an isolated granule on pre-spinal area (interstria 4) which corresponds to accessory anterior spine in *C. concretus*. *Legs* as in *C. spinipennis* but with dark setae throughout and corbels very narrow, with only 1–3 distinct adventitious setae.

Vestiture of two main types. In Tammin and Lake Grace specimens, male has sharply defined pattern in white on black (apparently bare) background (Text-fig. 57). White scales large and imbricate, brilliant white with pearly lustre; background scales smaller, bronzy and dense on head, prothorax and elytral declivity; on disc of elytra very small, thin, closely appressed, separate and dark but iridescent. Females from same localities have pattern similar but less sharpely defined and background scales all of intermediate size, bronzy with green reflection, more or less obscuring the cuticle. In second type (from Wattening–Bejoording area) (Text-fig. 56) white elytral markings are reduced and large areas, including sutural stripe (interstria 1) and interstriae 4 and 6 (on disc) are occupied by rather small bright golden scales; also median and post-ocular tracts on prothorax and frontal region of head are sometimes partly or wholly golden. The holotype (locality uncertain) has no golden scales; all large scales are pale bluish grey, some with weak coppery reflection. (Some Wattening–Bejoording specimens with few golden scales approach pattern of holotype). Scales on legs and antennae imbricate, usually bronzy (often with green reflection), with sprinkling of greenish or bluish white scales (which sometimes predominate, especially on shafts of femora); setae dark, hair-like. Scales on venter dense, usually pale throughout but in males from Tammin and Lake Grace they are uniformly white at sides of each ventrite and on anterior part of 1 and 2; elsewhere uniformly dark; setae small and dark.

Aedeagus (Text-fig. 51) depressed in mid-line above, strongly and evenly convex below; apex moderately produced, tip broadly rounded, not deflexed; sides sometimes with irregular wrinkles. *Ovipositor* with valves apically explanate, flattened and blade-like.

Holotype ♂, with ' Champion B.' and ' Catasarcus/marginispinis/*type* Pasc.' in BM(NH). Unique (' My specimen ').

A total of 26 specimens seen (14 W, 6 S, 5 BM(NH), 1 A).

Localities: Wattening; Bejoording; Tammin; Lake Grace. The published type-locality is probably inaccurate, if not actually false.

Colour patterns in this species require further study. It seems remarkable that specimens from Tammin should be identical with those from Lake Grace (100 miles SSW) but strikingly different from those from Wattening and Bejoording (about 60 miles WNW).

It might be thought that Pascoe's name refers to the sharp tubercles on the basal margin of the elytra but in fact he was impressed by the way the tapering tracts of

pale scales ascend the basal portion of the dorsal spines: ' The disposition of the scales on the spines gives the latter the appearance, when viewed under an ordinary lens, of being margined (with black) '.

Catasarcus albisparsus Pascoe

(Text-figs. 50, 58)

Catasarcus albisparsus Pascoe, 1870 : 16, 35.
Catasarcus capito Pascoe, 1870 : 17, 33, **syn. n.**
Catasarcus capito Pascoe; Lea, 1897 : 597.
Catasarcus albisparsus Pascoe; Lea, 1897 : 598.

Length 7·6–10·2 mm. Body, including post-humeral spines, black; antennae, legs and dorsal elytral spines dark red. Scales forming a pattern of white lines and patches on a black background (Text-fig. 58). *Head* as in *C. cicatricosus* but eye only × 1·3 as long as broad; scales brown on vertex and middle of frons, elsewhere white. *Rostrum* as in *C. cicatricosus* but median carina more or less in line with frons in profile view, not strongly raised or arched; scales brown on carina, elsewhere white. *Antennae* with lengths of funicle segments 1–3 in ratio 3 : 1·5 : 1 (mean of five); scales small, dense and mostly dull. *Prothorax* subcylindrical, weakly transverse (10 : 13·4–15·6), a little wider at base than at apex (especially in female); sides weakly to moderately rounded, broadest about middle; post-ocular lobes angular, vibrissae longest at the angle (cf. *C. marginispinis*); dorsal surface obscurely granulate (sometimes with well defined granules at sides); both transverse striae very strongly impressed; weak linear impression in mid-line; white scales imbricate and forming a sharply defined pattern or less dense and pattern ill-defined; remaining areas bare or with small inconspicuous brown scales. *Scutellum* with numerous ovate light or dark scales. *Elytra* globose-acuminate (10 : 7·2–7·9), less elongate, on average, in male than in female; humeral tubercle obsolete in male, moderate and acute in female; very small basal tubercle present on interstria 3 (always), 2 (often) and 5 (sometimes); post-humeral and dorsal spines as in *C. spinipennis* but latter in similar position in both sexes (see p. 424); disc with sinuous undulating transverse folds or a strongly raised reticulum (sometimes interspersed with raised granules); scale-pattern (Text-fig. 58) includes imbricate white scales on interstria 1 (to level of posterior dorsal spines), 3 (almost to level of anterior dorsal spines), 9 and 10 (but not, or only partly, on post-humeral spine); similar scales form an oblique tract at sides below anterior spine; this tract breaks up posteriorly and, like the sutural stripe, merges with the smaller duller scales of the declivity; remaining areas, which appear bare, are in fact occupied by fairly dense, very small appressed brown or bronzy scales (as in some *C. marginispinis*); dorsal spines and declivity distinctly setose. *Legs* as in *C. nephelodes* but scales mostly pale throughout and denser on femora; corbels with 2–10 adventitious setae. *Venter* and *thoracic sterna* densely squamose throughout; scales large, great majority white or pearly. *Aedeagus* (Text-fig. 50) narrowest in middle of length, flat or weakly concave dorsally, convex and smooth ventrally; apex short, tip blunt, weakly swollen, not deflexed. *Ovipositor* as in *C. marginispinis*.

The following specimens are in BM(NH):

Holotype of *albisparsus*, ♂, with ' Champion B.' and ' Catasarcus/albosparsus [*sic*]/*type* Pasc.' Apparently unique. A slightly larger specimen, from the Fry collection, has ' 37857 '; ' TYPE '; ' De Boulay '; 'Nov. Holl'/Swan R.' and ' albosparsus/Pasc.', the last in Pascoe's hand.

Holotype of *capito*, ♀, with ' Champion B.' and ' Catasarcus/capito/*type* Pasc.' Almost certainly unique but another specimen from Pascoe's main collection bears a label ' capito ' in his hand.

Six specimens seen (all BM(NH)).

Localities: None certain; probably occurs in the Geraldton area.

The ' sand-like exudation ' mentioned by Pascoe in the description of *C. capito* is discussed on p. 365 above.

This species bears a superficial resemblance to the black and white form of *C. marginispinis* but is at once distinguished from the latter by its red dorsal elytral spines.

Catasarcus cicatricosus Pascoe

(Text-fig. 60)

Catasarcus cicatricosus Pascoe, 1870 : 17, 36.
Catasarcus ochraceus Pascoe, 1870 : 17, 34, **syn. n.**
Catasarcus ochraceus Pascoe; Lea, 1897 : 598.
Catasarcus cicatricosus Pascoe; Lea, 1897 : 599.

Length 8·3–10·8 mm. Body, including post-humeral spines, black; antennae, legs and dorsal elytral spines red to blackish red. Scales golden or brownish grey; elytra with well marked white flash at sides. *Head* as in *C. spinipennis* but lateral frontal carinae further reduced (sometimes obsolete); frons weakly convex and without a median cariniform elevation; eyes weakly convex, about × 1·5 as long as broad. *Rostrum* as in *C. spinipennis* but genae wider, hence only × 1·1 as long as broad, epistome shorter (hence transverse) and median carina raised at base. Head and rostrum densely squamose throughout; scales large, pearly or bluish white, imbricate and brilliant below and (narrowly) around eye; setae mostly white on rostrum and frons; both scales and setae brown on vertex. *Antennae* with lengths of funicle segments 1–3 in ratio 2·7 : 1·4 : 1 (mean of five); scales dense, mostly pale. *Prothorax* barrel-shaped, less strongly transverse than in *C. spinipennis* (10 : 13·7–16), base scarcely broader than apex; dorsal surface smooth, with at most a few low ill-defined granules; both transverse striae moderately to strongly impressed but interrupted in mid-line which is sometimes narrowly impressed; scales mostly whitish or golden along mid-line and at sides (sometimes forming well defined stripes) and filling anterior constriction, elsewhere mainly dark; setae brown. *Scutellum* undefined; scutellar area of mesonotum usually almost flat (adjoining parts of elytral base consequently depressed) and covered with small ovate pearly scales. *Elytra* somewhat as in *C. spinipennis* (ratio of dimensions 10 : 6·7–7·5) but often more strongly convex, post-humeral spine usually larger and more slender, humeral tubercle moderate to absent (sharp when present) and with a small sharp shiny forwardly-directed tubercle at base of interstriae 2, 3 and sometimes 5; disc with transverse folds weaker than in *C. spinipennis* but often with strongly raised granules on interstriae 5 and 7 between level of anterior side of post-humeral spine and same of anterior dorsal spine; scales dense, predominantly golden or golden yellow (rarely grey), small; larger pearly white imbricate scales form a broad tract at side, extending from dorsal side of post-humeral spine (interstria 9) obliquely across interstria 8 and along entire width of interstria 7 (which is here broader and more strongly convex than adjacent interstriae) to point where striae 6 and 7 meet; similar scales present on apical part of interstria 9 and sometimes along basal half of 3; dorsal granules (when large) and ventral part of post-humeral spine, bare; setae brown, those on dorsal spines conspicuous. *Legs* as in *C. nephelodes* but hind tibial teeth more regular, corbels with numerous adventitious setae (about twenty) and claw-segment × 1·1 as long as 2 + 3 in female, × 0·86 as long in male; setae brown throughout. *Venter* and *thoracic sterna* with dense, mostly very pale scales throughout; setae brownish. *Aedeagus* (Text-fig. 60) depressed, tapering continuously from base to apex; flat and weakly sclerotized dorsally, strongly convex and smooth ventrally; apex somewhat elongate, tip swollen, not at all deflexed. *Ovipositor* with valves explanate and shaped as in *C. albisparsus* but very thick, not blade-like.

The following specimens are in BM(NH):

Holotype of *cicatricosus*, ♂, with ' Champion B.' and ' Catasarcus/cicatricosus/ *type* Pasc.' Unique. The other specimen mentioned by Pascoe (p. 37) is a small female with ' Champion B.' and ' cicatricosus/var.? ' in Pascoe's hand.

Holotype of *ochraceus*, ♂, with ' Champion By ' and ' ochraceus '. Apparently unique.

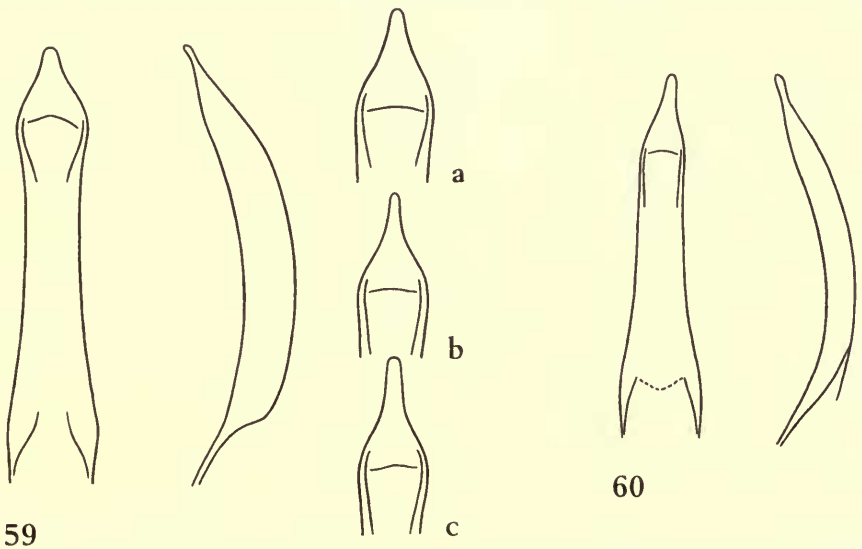
A total of 9 specimens seen (7 BM(NH), 1 V, 1 Manchester; the last lacks head and prothorax).

Localities: None certain; presumably occurs in the Geraldton area. Two specimens from the Fry collection are labelled ' De/Boulay '; ' Nov. Holl./Swan R. ' but this locality is believed to be false (see above, p. 430).

Catasarcus murex sp. n.

(Text-figs. 19, 20, 61, Map 4)

Length 7·7–12 mm. Head and body black; prothorax, antennae, legs, elytral spines and larger tubercles, dark red. Scales mainly brilliant pearly white, tending to form longitudinal stripes on prothorax and elytra; brown powdery exudate often present. *Head* with frons flat to distinctly convex; lateral frontal carinae reduced anteriorly, often obsolete or replaced by carinulae but sides of frons above eye often angulate or even carinate; admedian carinae short, converging anteriorly; median sulcus variable, smooth or finely striated, with no median elevation; eyes very weakly convex and × 1·5 as long as broad. *Rostrum* < × 1·3 as long as broad, strongly widening apically; epistome small, ill-defined, strongly pitted, with a few small white scales and setae posteriorly; median carina usually raised and projecting posteriorly over transverse furrow; chin well marked. *Antennae* with lengths of funicle segments 1–3 in ratio



Figs. 59, 60. *Catasarcus* spp. Aedeagus in dorsal and lateral view. 59, *C. carbo* Pascoe (holotype). 59*a–c*, *Idem*, apex showing variation (*c* is from Murchison River Reserve). 60, *C. cicatricosus* Pascoe (holotype).

2·5 : 1·45 : 1 (mean of five); scape and funicle densely squamose throughout, scales bronzy with a sprinkling of pale scales. *Prothorax* transverse (10 : 16–17·4 (♂), 17·4–19 (♀)), broadest between middle and base; sides weakly rounded, converging anteriorly; post-ocular lobes well developed, rounded; anterior constriction weak; dorsal surface uneven but smooth, with very small scattered punctures; transverse striae variable; some granules present near hind margin and at sides; basal marginal stria distinct. *Scutellum* usually obsolete, narrow and strongly convex when present; entire scutellar area of mesonotum with numerous pearly scales. *Elytra* ovate-acuminate, proportions fairly constant and similar in the two sexes (10 : 6·7–7·1); humeral tubercle obsolete or absent in male, small to moderate and sharp in female; post-humeral spine large, axis coincident with that of fellow or inclined weakly (rarely strongly) anteriad, tip reflexed posteriad; each elytron with four large dorsal spines: one post-median (and longest) in interstria 2, two medians in interstriae 3 and 5 and one pre-median in interstria 4; dorsal spines more elongate in male than in female (Text-figs. 19, 20); interstriae 2, 3, 5 and 7 on disc each with a regular row of rounded or sharp granules (sometimes poorly developed in male), 3 and 5 in addition with single large pre-basal granule or callus; isolated granule (rarely two) usually present on interstria 5 at level of post-median spine; further very small isolated granule sometimes present on interstria 3 between level of post-median spine and apex; interstriae 3, 5 and 7–9 all strongly convex posteriorly (7 usually bare and shiny); 3 and 9 unite short of apex forming a prominent Y-shaped elevation.

Vestiture dense but more or less discontinuous. Head and rostrum with dense round white scales, imbricate below eye; centre of frons bare; vertex with mixed pale and bronzy scales; dorsal setae erect brown and conspicuous. *Prothorax* with median, adlateral and lateral white stripes, anterior end of adlateral stripes incurved and frequently detached as a pair of separate admedian patches; underside with imbricate, predominantly bronzy scales. Elytra in Lake Grace and Albany specimens (Text-fig. 61) with a sharply defined series of white imbricate-scaled interstrial tracts, thus: on interstria 1 from base to level of posterior side of post-median spine; on 2 at base only (to level of anterior side of pre-median spine); on 4 from base about to level of post-median spine, interrupted by pre-median spine which it narrowly ascends posteriorly; on 6 throughout, except for short gap in middle; on 8 throughout, including humerus and uniting posteriorly with tract on 6; on anterior half of 9 and 10 (plus marginal strip), here sprinkled with olive-brown scales and ascending post-humeral spine dorsally to near its apex; remaining areas with very thin, closely appressed, translucent scales (hence appearing bare) or with brown scales, notably on declivity from suture to stria 4. In the Albany specimen, tracts on anterior part of interstria 5 and posterior part of 8 are indistinct or missing but there are additional short tracts on 2 and 5 immediately behind (and narrowly ascending) post-median and outer median spines respectively; a further short tract on 7 unites hind end of foreshortened tract on 8 with those on 6 and 5 to form a large oblique patch. Similar but less well defined markings occur in the Bridgetown and Hester specimens (none of which is fresh).

Legs with femora slender; fore and middle tibiae incurved towards apex, teeth moderate, corbels with both fringes complete and with numerous adventitious setae but no scales; scales mixed bronzy and pearly, imbricate-tessellate throughout, mainly pearly on femora, mainly bronzy on tarsi; setae brown, rather conspicuous. *Venter* without post-coxal cavities but anterior marginal stria sometimes very deeply impressed in both sexes; imbricate white scales present at sides of ventrites 2–5, elsewhere with mixed pale and dark (or hyaline) scales. *Aedeagus* stout, terete, smooth, not widening at level of phallotreme; apex rather short, tip blunt, scarcely swollen, not deflexed. *Ovipositor* short, valves apposed, evenly tapering, about as high as together broad.

Holotype ♂. WESTERN AUSTRALIA: Bridgetown, 1919–206, in the Western Australian Museum, Perth.

Paratypes. 1 ♂, 2 ♀, same data as holotype (2 W, 1 BM(NH)); 3 ♂, 5 ♀, same locality (*J. Clark*) (3 FEW, 2 V, 2 S, 1 BM(NH)); 2 ♂, 3 ♀, same locality, i.1914 (*H. J. C[arter?]*) (3 A, 2 V); 1 ♂, 1 ♀, same locality (*Lea*) (S); 2 ♀, same locality (printed label) (BM(NH), V); 2 ♂, W. Australia (Bridgetown on series label), Macleay

coll. (Macleay); 1 ♂, 1 ♀, Hester (*J. Clark*) (BM(NH)); 1 ♂, 1 ♀, Lake Grace (S); 1 ♂, Albany, Pascoe coll. (BM(NH)); 1 ♂, Adelaide (*Plason*) (Dresden); 1 ♂, 3 ♀, W. Australia (no further data) (3 V, 1 A); 1 ♂, ditto, G. Masters coll. (Macleay); 1 ♂, 1 ♀, with '6420/W.A.' (in red) (S); 1 ♂, without data, Chevrolat coll. (Stockholm). Total: 37 specimens.

Localities: Bridgetown; Hester; Lake Grace. The record for Albany is likely to be highly inaccurate and that for Adelaide is obviously false.

This very distinctive species has been repeatedly misidentified in collections as *C. tribulus* Pasc. (= *C. lepidus* Pasc.) to which it bears little resemblance. Furthermore, the row of tubercles in interstria 1 by which Pascoe separates *C. tribulus* in his key does not occur in the present species.

The spiniest species. The name was proposed by Marshall (i. litt.).

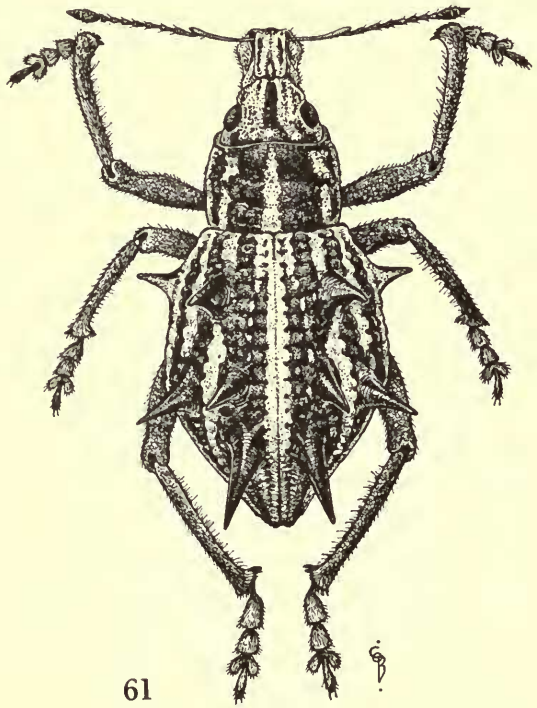


FIG. 61. *Catasarcus murex* sp. n. ♂ (Lake Grace).

Catasarcus armatus Blackburn

(Text-figs. 21, 62, Maps 1, 4)

Catasarcus armatus Blackburn, 1893 : 271.
Catasarcus spinipennis; Froggatt, 1907 : 182 [?].
Catasarcus armatus Blackburn; Lea, 1918 : 267.

Length 9·5–15·5 mm. Entirely black (legs brown in teneral specimens). Scales dense throughout, bronzy with ill-defined pattern of whitish or golden scales; scanty brown powdery

exudate often present. *Head* with frons flat or weakly convex, usually with prominent tectiform or rounded, smooth or striated median cariniform elevation, extending from near transverse furrow to vertex (if absent, wide area of frons strongly striated); lateral frontal carinae well developed, sharp, parallel, each more or less strongly incurved anteriorly and continued posteriorly above eye to its hind margin; admedian carinae straight, strongly converging anteriorly where they are equidistant from laterals and each other and distinctly higher than laterals; eyes oblong-acuminate, × 1·5 as long as broad and very weakly convex. *Rostrum* < × 1·2 as long as broad, strongly widening at genae which are abruptly truncate apically; epistome large, triangular, flat, finely pitted and microreticulate; median carina not always clearly defined from epistome, sometimes microreticulate, more or less strongly raised or upturned at base and projecting over the very deep transverse furrow; projection usually emphasized by oblique basal carinae, elevation emphasized by declivity of hind angles of dorsal area; latter usually strongly sulcate in front of oblique basal carinae; chin weak. *Antennae* with lengths of funicle segments 1–3 in ratio 2·2 : 1·7 : 1 (mean of seven); vestiture throughout, or at least on segment 7, composed partly to almost entirely of very small dark scales and not differing greatly in appearance from that of club; pale scales tend to be confined to mesal side of each segment when in minority. *Prothorax* transverse (10 : 14·8–17·6), subcylindrical; sides converging anteriorly; post-ocular lobes large, somewhat angulate; sides and dorsal surface (except anterior third) with more or less distinct granules; both transverse striae distinct and almost or quite complete. *Scutellum* as in *C. carbo*. *Elytra* globose-acuminate (10 : 6·9–7·6); base wider than base of prothorax and more or less distinctly excavated; humeral tubercle absent in male (but sides of base prominent), large sharp and pre-basal in female; post-humeral spine small; each elytron (Text-fig. 21) with four dorsal spines: large posterior spine in interstria 2 at top of very steep declivity (almost vertical in female); two smaller, broadly conical spines in interstriae 3 and 4 on line between posterior spine and shoulder; similar fourth spine in interstria 5 about at level of that in 3 and completing equilateral triangle with this and spine in 4; foremost or outermost spine occasionally obsolete in both sexes; posterior pair long, subcylindrical, weakly diverging or parallel or even converging in male; in female shorter, more evenly tapering, weakly diverging; disc of elytra with transverse folds and strongly raised sharp or rounded granules, notably in female along interstria 7 from humeral tubercle to about level of foremost dorsal spine; female also has large granule or callus at or near base of interstria 3 and sometimes also 2 (traces of these often present in male). *Legs* as in *C. carbo* but corbel without scales and outer fringe of setae normal; few to many adventitious setae present; clothing setae small, dark and inconspicuous. *Venter* in male with deep post-coxal groove and ventrite 1 with prominent bead-like granules at sides.

Vestiture uniformly dense except on spines and larger tubercles. Scales mainly whitish on rostrum and underside of head (dense but seldom imbricate below eye); whitish or golden on frons, with admedian carinae completely covered; mostly bronzy on centre of frons and vertex but thinly sprinkled with pale blue metallic scales; bronzy on prothorax, densely sprinkled with whitish scales in mid-line and at sides; mainly bronzy on elytra but usually whitish or golden along suture, at base, along costal margin (interstria 10 anteriorly, 9 posteriorly), on interstria 4 between spines on adjacent interstriae and in most strial punctures. Venter with mixed light and dark scales but only light at sides of each ventrite. Setae throughout small, dark recumbent and inconspicuous.

Aedeagus terete, smooth, scarcely widening at level of phallotreme; apex narrow but tip rather broadly rounded, very weakly deflexed. *Ovipositor* with valves explanate, strongly flattened and blade-like.

Holotype ♀, with ' 1315/W. A.' (red), ' T.' (black, on same label) and ' Catasarcus/armatus, Blackb.' (in Blackburn's hand), in BM(NH). Marshall has added the following data, given with the description: ' W. Australia/Gnarlbine/French '. The range of dimensions given by Blackburn indicates a series of specimens, though he states that the description is based on one only. Two specimens (not seen) in the South Australian Museum, without localities, may be paratypes.

A total of 43 specimens has been seen.

The range of this species is so vast, compared with all the other species, and so uncertain that it seems desirable to give the data of the available specimens in full: WESTERN AUSTRALIA: 1 ♀, Gnarlbine [Gnarlbine Rock] (*French*) (BM(NH)); 1 ♂, Kalgoorlie (*Du B*[*oulay*]) (V) (also recorded for this locality by Lea, 1918 : 267); 1 ♂, 1 ♀, Coolgardie (*Du B*[*oulay*]) (V); 1 ♂, 1 ♀, Dedari, 23–25.i.1962 (*A. M. Douglas* and *L. N. McKenna*) (W); 1 ♂, 1 ♀, Innes district, 126° E., 27° S., v–vi.1964 (*M. Gillett*) (W); 1 ♂, Beverley (*F. H. du B*[*oulay*]) (A); 1 ♂, same locality, K. K. Spence coll. (A). NORTHERN TERRITORY: 1 ♂, Ayer's Rock, 2.v.1952 ('*Aust. Museum N. W. Aust. party*') (A). SOUTH AUSTRALIA: 2 ♂, 1 ♀, Ooldea (*A. M. Lea*) (S); 1 ♂, Fowlers Bay, 2.xii.1901 (*Maurice*) (S); 1 ♂, same locality, 16.v.1901, 'Pres. by R. T. Maurice 16–5–01' (V); 1 ♀, same locality, 'K 12,011' (A); 1 ♂, Fisher [Fisher Siding] (*Le Souëf*) (V). In addition to these fairly precise records, there exists a series of 4 ♂, 6 ♀, labelled: 'Everard Rgs., S. A./to Warburton Rgs., W. A./ A. Brumby' (7 S, 3 BM(NH)). The records for Beverley are unlikely to be genuine.

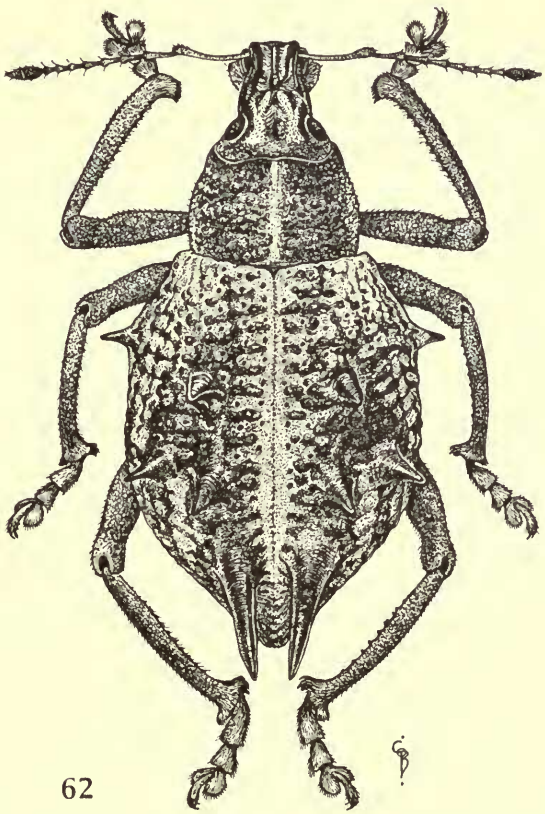


FIG. 62. *Catasarcus armatus* Blackburn ♂.

Specimens of this species have been taken by A. M. Douglas at Seemore Downs on the Nullarbor Plain, ix.1967. This is roughly midway between the Kalgoorlie and South Australian records. This information was received too late for inclusion on Map I (p. 361).

Host-plants. The Dedari specimens were taken on ' small stunted Eucalypt '. Mr. Douglas (personal communication) adds, ' Conditions very dry with Mallee and *Triodia* the only vegetation nearby '.

The holotype is a very large (15·5 mm.), teneral female. It is not as ' sparingly supplied with scales ' as it looks; being teneral, the entire cuticle is brown so that only the pale scales are evident. These pale scales vary in different specimens from white, through various shades of brown, to a fiery golden red colour. The colouring may result, at least partly, from the presence of powdery exudate. Although specimens taken together have scales of similar colour, there is no clear evidence that this, or any other form of variation is territorially restricted. This is indeed astonishing in view of the subspeciation observed in several other species with very much smaller ranges.

Catasarcus lepidus Pascoe

(Text-figs. 22, 63)

Catasarcus lepidus Pascoe, 1870 : 17, 39.
Catasarcus trapa Pascoe, 1870 : 17, 38, **syn. n.**
Catasarcus furfuraceus Pascoe, 1870 : 17, 39, **syn. n.**
Catasarcus tribulus Pascoe, 1870 : 17, 40, **syn. n.**

Length 10–14 mm. Black; antennae, parts of legs and tips of all elytral spines very dark red. Scales dense, mostly sombre but with whitish scales forming a simple pattern on elytra (Text-fig. 63); no powdery exudate observed. *Head* subglobular; lateral frontal carinae absent; admedian carinae short, not or very poorly defined externally and strongly converging anteriorly; eyes small, rounded (× 1·3 as long as broad), weakly to moderately convex; middle of frons even, smooth; median sulcus deep, smooth, sometimes with a few striations or carinulae. *Rostrum* × 1·1–1·2 as long as broad, strongly widening apically; epistome well defined, transverse, disc weakly depressed, finely microreticulate, with two small setae in median cleft; dorsal area declivous posteriorly and there much narrower than between antennal insertions, thus leaving more of shelf above scrobes exposed (in dorsal view); median carina tenuous and obscured by scales anteriorly, broad tectiform raised and projecting beak-like posteriorly over abbreviated transverse furrow; chin well marked. *Antennae* with lengths of funicle segments 1–3 in ratio 3·15 : 1·7 : 1 (mean of eight); segment 7 from as long as broad to × 1·5 as long. *Prothorax* as in *C. carbo* (10 : 14·3–15·8) but median stripe less distinct. *Scutellum* as in *C. carbo* but brown scales often present. *Elytra* broadly ovate-acuminate (10 : 6·8–7·4); humeral tubercle absent in male, small sharp and pre-basal in female; post-humeral spine in male large and slender, often curving dorsad or posteriad, in female less elongate and not or less strongly curved; each elytron (Text-fig. 22) with four main dorsal spines: large posterior spine in interstria 2 at top of declivity; slightly shorter anterior spine in interstria 3, in line with posterior spine; two smaller spines in interstria 5, one adjacent to anterior spine, the other between level of post-humeral spine and base; all spines longer in male than in female; striae impressed throughout, punctures deep in male, shallow in female, disc without transverse folds but with variable number of sharp tubercles, especially along interstriae 2 and 3 and around basal spine; sometimes small accessory basal spine present on interstria 3 between anterior spine and base; occasionally a row of small tubercles present along outer side of interstria 1 (otherwise smooth). *Legs* as in *C. carbo* but segment 3 of tarsi smaller. *Venter* with no post-coxal cavities or deep groove in male; granules at sides of ventrite 1 small.

Vestiture composed of very dense or imbricate, mainly olive-brown or bronzy scales but brilliant white at sides of elytra on interstriae 7 and 8; pale area behind shoulders (as in *C. carbo*); suture pale but scales mostly pale olive-brown; striae and punctures bare in male, producing striped effect. Remainder of body and head fairly uniform; scales olive-brown thinly to densely sprinkled with pearly white scales. Such vestiture covers entire rostrum, including median carina (but not epistome) and head, except median frontal sulcus; eye sometimes very narrowly encircled with white (cf. *C. carbo*). Prothorax with pale (but not brilliant) median stripe only. Antennae and legs as in *C. carbo*.

Aedeagus similar to that of *C. spinipennis*; somewhat flattened above, otherwise terete and smooth; apex strongly tapering, tip weakly deflexed. *Ovipositor* with valves explanate and strongly depressed.

The following are in BM(NH):

Holotype of *lepidus*, ♂, with ' Champion B.' and ' Catasarcus/lepidus/*type* Pasc.' Almost certainly unique. There are two further specimens from the Pascoe coll. (one with an extra spine in interstria 3 in front of the anterior spine) and one from the Fry coll. (' De Boulay/Swan R.'), determined by Pascoe.

Holotype of *trapa*, ♀, with ' Champion B.' and ' Catasarcus/trapa/*type* Pasc.' Unique.

Holotype of *furfuraceus*, ♂, with ' Champion B.' and ' Catasarcus/furfuraceus/*type* Pasc.' Unique.

Holotype of *tribulus*, ♀, with ' West Australia ' (not Champion Bay, as stated by Pascoe) and ' Catasarcus/tribulus/*type* Pasc.' Almost certainly unique. A specimen from Pascoe's supplementary collection (without locality) and another from the Fry collection (' De Boulay/Swan R.') have been determined as this species by Pascoe.

A total of 17 specimens has been seen (12 BM(NH), 4 Oxford, 1 V).

Localities. None certain. The Victoria Museum specimen bears a label in F. E. Wilson's hand, ' Mayanup, W. A./H. Baker ' but I am inclined to doubt the validity of this record. The Swan River record from the Fry collection is thought to be false for the reasons given on p. 430 above, although one of the Oxford specimens is labelled: ' Swan River/West Australia/De Boulay 1869 '.

Pascoe described the sexes of this weevil as distinct species, thus the holotype of *C. lepidus* is a normal male while that of *C. trapa* is a normal female; that of *C. furfuraceus* is a male contaminated with extraneous granules; that of *C. tribulus* is a female with a row of small raised granules along interstria 1.

Males of this species bear a striking resemblance to those of *C. carbo* (southern form), their additional dorsal spines notwithstanding.

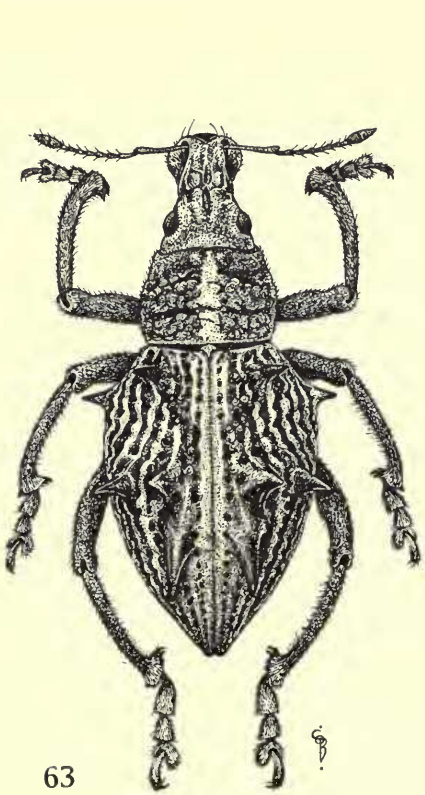
Catasarcus carbo Pascoe

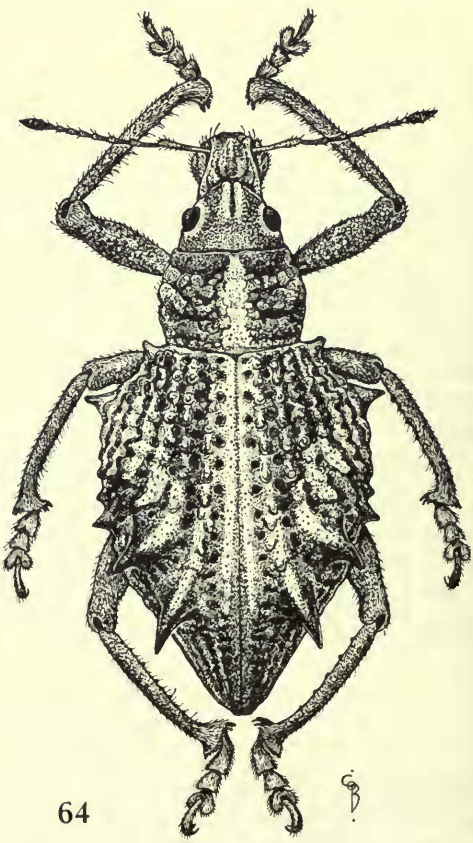
(Text-figs. 23, 59, 64, Map 4)

Catasarcus carbo Pascoe, 1870 : 16, 35.
Catasarcus spinipennis Fåhraeus (?), var. *insignis* Lea, 1917 : 721, **syn. et stat. n.**

Length 10·5–15·5 mm. Black; antennae, legs and elytral spines dark red. Scales below and at sides imbricate and mostly pearly, above similar or greenish, in patches forming a regular

pattern, punctures bare; setae on body very small and dark; no powdery exudate observed. *Head* with frons weakly convex; lateral frontal carinae reduced, very broadly rounded, usually partially subdivided, often obsolete; admedian carinae broad, variable in size, usually straight and weakly converging anteriorly (rarely strongly curved); median frontal sulcus also variable, extending posteriorly to level of middle of eyes; middle of frons smooth or finely striated, flat or with trace of median elevation; eyes × 1·2 as long as broad, very strongly convex, sometimes bun-shaped. *Rostrum* as in *C. lepidus*. *Antennae* with lengths of funicle segments 1–3 in ratio 2·8: 1·6: 1 (mean of nine), 7 about ×1·5 as long as broad. *Prothorax* transverse (10 : 13·7–16·1), broadest about middle; sides weakly to strongly rounded, usually subparallel in basal half; post-ocular lobes obsolete or weak, vibrissae short; dorsal surface with complete smooth or weakly impressed median line which bisects a prominent transverse swelling near anterior margin; disc on either side of line with strongly raised rugae and granules, with smaller, more regular granules towards the sides; anterior transverse stria usually lost among the granules, posterior stria abbreviated or deformed but very deep. *Scutellum* not abruptly raised; entire scutellar area of mesonotum densely squamose. *Elytra* ovate-acuminate (10 : 6·6–7·3); humeral tubercle in male obsolete or very small and rounded, in female pre-basal, small to moderate, and very sharp (sometimes spiniform); post-humeral spine small to moderate, axis usually inclined antero-dorsad; dorsal spines as in *C. spinipennis*, posterior longer





FIGS. 63, 64. 63, *Catasarcus lepidus* Pascoe ♂ (holotype) 64, *C. carbo* Pascoe ♀.

in male (Text-fig. 23) than in female and less rapidly tapering (often subcylindrical), × 0·9–1·2 (anterior) and 1·7–1·9 (posterior) as long as broad at base in male, × 0·8–1 and 1·2–1·4 respectively in female; striae distinctly to strongly impressed on disc and at sides; interstria 1 flat and smooth, interstriae 2–6 (–7) on disc with very strong elevations opposite gaps between successive strial punctures; these elevations may take the form of rounded granules which unite transversely to form irregular sinuous transverse folds, deeply incised by the striae (as in *C. intermedius*), or sharp spiniform granules, or a combination of the two; above a certain height, the latter have red tips and when isolated resemble accessory dorsal spines, notably in some females (Text-fig. 64) on interstria 5 at its flexure below the anterior spine and on interstria 4 in front of this spine. *Legs* with tibial teeth small and fairly regular; corbels narrow, more or less filled with appressed subhexagonal or oblong-acuminate brilliant pearly white scales, together with up to ten adventitious setae, outer fringe of setae defective; tarsi with claw-segment × 0·7–0·8 as long as 2 + 3 in male, × 0·8–0·9 as long in female. *Venter* as in *C. lepidus*.

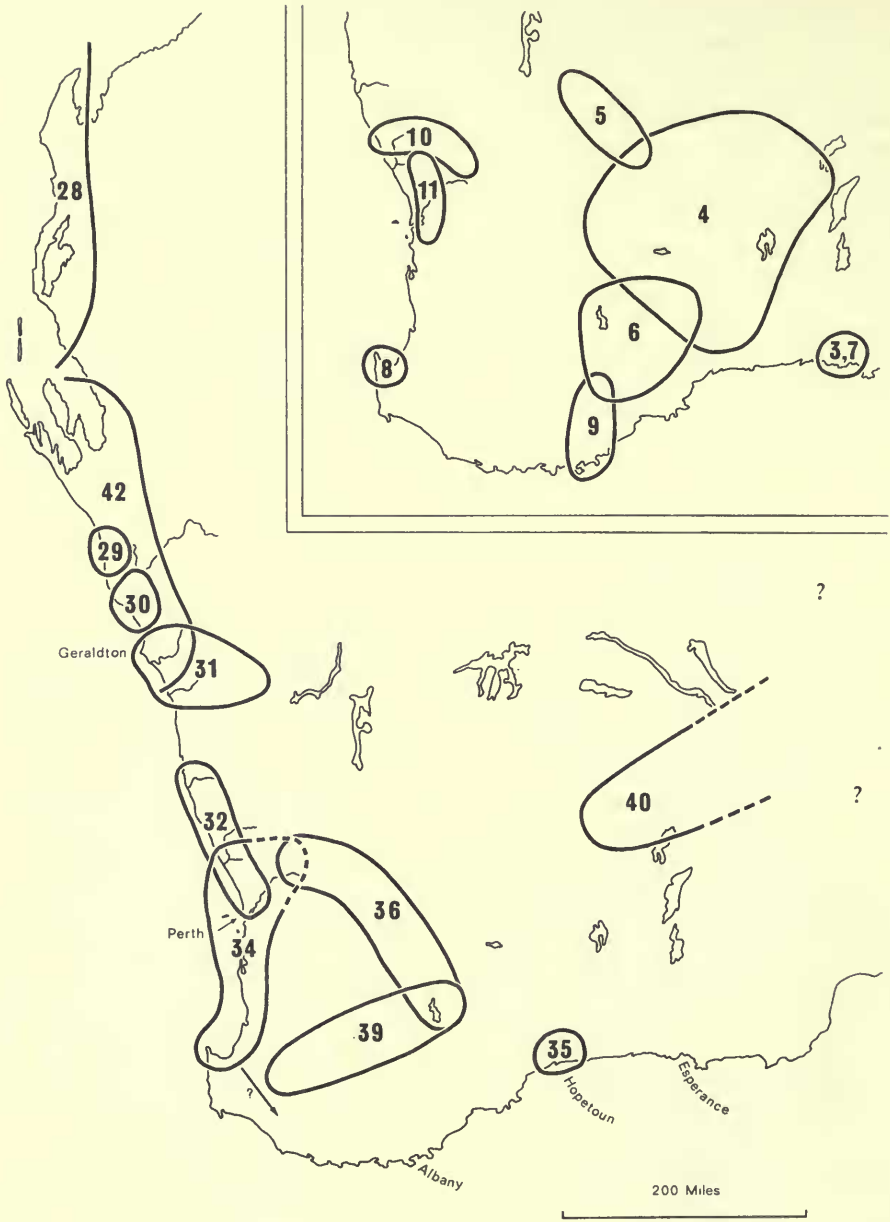
Vestiture very variable. Underside throughout (including head) with imbricate whitish scales, often with strong metallic pink, coppery and green reflections and often with a proportion of light or dark bronzy scales intermixed. Eyes encircled with white imbricate scales; rest of head (above) and rostrum with very dense whitish and bronzy scales mixed in wide range of proportions. Prothorax with narrow median tract of imbricate closely appressed white scales (sometimes some with vivid golden reflection), flanked by broad tracts of dense, mainly bronzy scales which cover the rugae and granules but leave at least the deeper interspaces bare; sides with dense whitish scales. Elytra typically with strial punctures, most striae and high elevations bare; sides with dense, often brilliant, whitish scales, usually with a narrow irregular tract of bronzy scales along middle of each interstria; declivity with mainly bronzy scales; disc of each elytron with a series of dense scale-patches forming an oblique tract from anterior dorsal spine to post-humeral spine. In specimens from Shark Bay and Murchison River Reserve these and other areas have imbricate but loose, often mostly acuminate, metallic golden yellow and green scales, thus: on interstria 1 from base to declivity; on interstriae 2–6 at extreme base; they form patches on interstria 2 in front of posterior spine (sometimes obsolete) and on 3 in front of anterior spine, ascending base of spine in each case; a large irregular patch near the anterior spine and anterior to it, extending over interstriae 4–6 and they cover a large area below and behind dorsal spines on interstriae 2–5. These areas are flat, with small strial punctures and scattered small black spots, where very small setiferous granules project between the scales; remainder of dorsal area sparsely squamose, hence dark in strong contrast to patches. Specimens from Eradu have pale areas very ill-defined and composed of round appressed pearly scales, similar to whitish ones at sides; interspaces more densely covered with mainly bronzy scales. Other specimens, from unknown localities, have almost no trace of pale areas. Antennae and legs with scales imbricate throughout, bright pearly and dull bronzy mixed in various proportions.

Aedeagus slender, apex unusually variable (Text-figs, 59*a–c*), the variation not related to variation in vestiture. *Ovipositor* similar to that of *C. lepidus*.

Holotype of *carbo*, ♂, with ' West Australia ' and ' carbo ' in BM(NH). Unique (' My specimen ').

Holotype of *insignis*, ♂, with ' Sharks/Bay. WA ' and ' Ty of var insignis Lea ' (the latter in Lea's hand), in the South Australian Museum, Adelaide.

Paratype ♂, with same locality label as holotype but no other label (S). The BM(NH) specimen mentioned by Lea cannot be recognized with certainty but may be a large female from Pascoe's main collection which bears a label ' E/48 ' only. Four further specimens are known with locality labels similar to those of the types and so presumably belong to the same series (2 V, 1 A, 1 Dresden). One of the



Map 4. *Catasarcus* spp. Ranges. 3, *bakeri*; 4, *obesus*; 5, *aspergetus*; 6, *azureipes*; 7, *varus*; 8, *ustulatus*; 9, *rugulosus*; 10, *aerosus*; 11, *griseus*; 28, *intermedius*; 29, *albipectus*; 30, *bicolor*; 31, *echidna*; 32, *nephelodes*; 34, *spinipennis*; 35, *concretus*; 36, *marginispinis*; 39, *murex*; 40, *armatus*; 42, *carbo*.

Victoria Museum specimens bears an accession label subscribed ' Pres by/C. French/ F.L.S. 19.1.10 '.

A total of 16 specimens seen.

Localities: Shark Bay; Murchison River Reserve (FHUB); Eradu (*J. Clark*) (FEW). A further Pascoe specimen is labelled ' Champion B.' and a Fry specimen ' De/ Boulay; ' Nov. Holl./Swan R.' The data of the foregoing specimens support my contention (p. 430 above) that the Fry specimen and others from that collection with the same data were taken around Geraldton, not Perth.

In spite of having only four dorsal elytral spines, this species is very closely related to *C. lepidus*. They have in common the only squamose corbels in the genus; the prothorax more strongly rugose on the disc than at the sides (instead of *vice versa*) and with a bifid thickening near the anterior margin; they also have round, convex eyes and very similar vestiture, a distinctive feature of which is a tendency to have bare striae, especially in the male.

Pascoe's description is based on a severely abraded (and partly bleached) specimen. This is singularly unfortunate since, as a result, one of Australia's most attractive insects must bear a wholly inappropriate name.

CHECK-LIST OF SPECIES (INCLUDING SYNONYMS, ETC.)

1. ***transversalis*** Germar **sp. rev.**
   (not syn. of *stygmatipennis* (Boisduval)).
2. ***t. anatolicus*** ssp. n.
3. ***bakeri*** sp. n.
4. ***obesus*** sp. n.
5. ***aspergetus*** sp. n.
6. ***azureipes*** sp. n.
7. ***varus*** sp. n.
8. ***ustulatus*** sp. n.
9. ***rugulosus*** Boheman
10. ***aerosus*** sp. n.
11. ***griseus*** Pascoe
12. ***latheticus*** sp. n.
13. ***bilineatus*** Fåhraeus
    suturalis Pascoe **syn. n.**
14. ***sericeus*** Blackburn
15. ***hopei*** Fåhraeus
    vinosus Pascoe **syn. n.**
    effloratus Pascoe **syn. n.**
    ovinus Pascoe **syn. n.**
16. ***carinaticeps*** Lea
17. ***frontalis*** sp. n.
18. ***opimus*** Pascoe
    ceratus Pascoe **syn. n.**
    granulatus Lea **syn. n.**
19. ***pallidiventris*** sp. n.
20. ***asphaltinus*** sp. n.
21. ***longicornis*** Pascoe
22. ***cygnensis*** sp. n.
23. ***coruscus*** sp. n.
24. ***laevior*** sp. n.
25. ***impressipennis*** (Boisduval)
    stygmatipennis (Boisduval) **syn. n.**
    rufipes Fåhraeus
    pollinosus Pascoe **syn. n.**
    foveatus Pascoe **syn. n.**
    maculatus Pascoe **syn. n.**
    mollis Lea **syn. n.**
    durus Lea **syn. n.**
26. ***inaequalis*** sp. n.
27. ***memnonius*** Pascoe **sp. rev.**
    (not syn. of *stygmatipennis* (Boisduval)).
28. ***intermedius*** Pascoe
29. ***albipectus*** sp. n.
30. ***bicolor*** sp. n.
31. ***echidna*** Pascoe
    bellicosus Pascoe **syn. n.**
    araneus Pascoe **syn. n.**
    humerosus Pascoe **syn. n.**
    funereus Pascoe **syn. n.**
    brevicollis Pascoe **syn. n.**
    scordalus Pascoe **syn. n.**
32. ***nephelodes*** sp. n.
33. ***albuminosus*** Pascoe
34. ***spinipennis*** Fåhraeus
    ericius Pascoe **syn. n.**
    nitidulus Pascoe **syn. n.**
35. ***concretus*** Pascoe
36. ***marginispinis*** Pascoe
37. ***albisparsus*** Pascoe
    capito Pascoe **syn. n.**
38. ***cicatricosus*** Pascoe
    ochraceus Pascoe **syn. n.**
39. ***murex*** sp. n.
40. ***armatus*** Blackburn
41. ***lepidus*** Pascoe
    trapa Pascoe **syn. n.**
    furfuraceus Pascoe **syn. n.**
    tribulus Pascoe **syn. n.**
42. ***carbo*** Pascoe
    insignis Lea **syn. et stat. n.** (not var. of *spinipennis* Fåhraeus)

Onesorus farinosus (Blackburn, 1896: 288) **comb. n.** (ex *Catasarcus*).

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INDEX

Host-plants marked †; synonyms in *italics*; page numbers of principal references in **bold type.**